NGINEERING
BRARY

September 20, 1948

SEP 21 1948

STEEL

The Magazine of Metalworking and Metalproducing

CONTENTS—PAGE 57

MODERN HIGH SPEED
COLD MILL . . .
. . . designed and built by MESTA

The World's Highest Speed Cold Mill . . . Mesta 42" Four-High, Five-Stand Tandem Cold Mill installed at Jones & Laughlin Steel Corporation, Aliquippa Works

COLOR PHOTO BY E. D. MESTA

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

TRANSPORTS AND PILES THEM HIGH

Large loads are handled speedily and without concern for aisle clearance or floor conditions with this motor-driven tote box grab and Cleveland Tramrail overhead rail system. Boxes are picked up, delivered and stacked by the cab operator, alone, with controls in the cab.

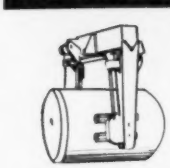
GET THIS BOOK!
BOOK No. 2008
Packed with valuable information . . .

CLEVELAND TRAMRAIL ENGINEERING AND APPLICATION DATA BOOK 2008

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7838 East 284th St. Wickliffe, Ohio

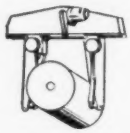
CLEVELAND TRAMRAIL

THIS 6000 LB. GRAB is Revolutionizing Roll Handling

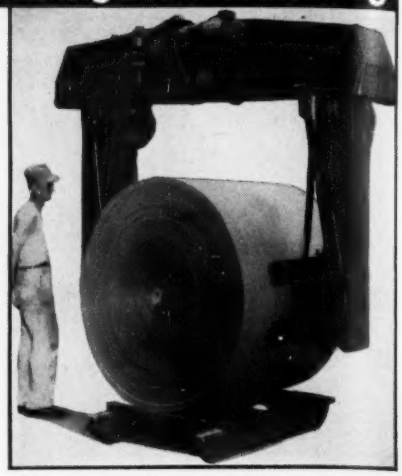


KRAFT PAPER

NAPKIN TISSUE



SOUND-DEADENING FELT



Handles rolls to 6000 lbs., 24" to 60" diameter, 72' long. All motions motorized and controlled from crane cab. Turns rolls from vertical to horizontal. Handles various materials without damage.

WRITE FOR BOOKLET 2012 GIVES DETAILS

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7838 East 284th St. Wickliffe, Ohio

CLEVELAND TRAMRAIL

5 TONS SHEET STEEL PER LOAD

- SPEEDS HANDLING
- LOWERS COSTS
- SAVES SPACE
- AIDS SAFETY

One man picks up, delivers directly where needed and unloads, easier, faster, safer, with a Cleveland Tramrail overhead system and sheet grab. Hand or electrically operated equipment.

GET THIS BOOK!
BOOK No. 2008
Packed with valuable information . . .

CLEVELAND TRAMRAIL ENGINEERING AND APPLICATION DATA BOOK 2008

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7838 East 284th St. Wickliffe, Ohio

CLEVELAND TRAMRAIL

New STABILIZED CRANE

HANDLES LOADS WITHOUT SWING

Raises, lowers and transports loads without swing because of patented hoisting rope arrangement. Advantageous for anodizing, dip painting, automatic welding, handling hot metal in foundries, etc. Many units now in operation speeding production and lowering costs.

GET THIS DATA
Graphic Vol. 1, No. 4 gives details.
Write for free copy.

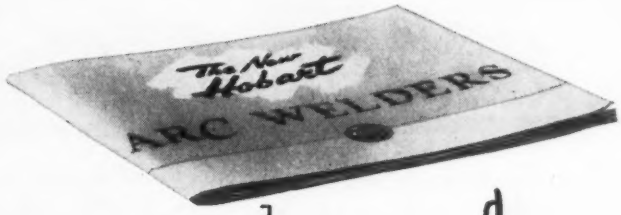
CLEVELAND TRAMRAIL STABILIZED Carrier GRAPHIC Volume 1, No. 4

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7838 East 284th St. Wickliffe, Ohio

CLEVELAND TRAMRAIL

The **right** arc welder for you is made by **HOBART**

"one of the World's largest builders of arc welding equipment ~



here's your free catalog...

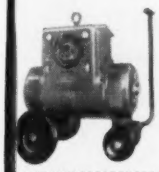
It's 36 pages, and it contains illustrations, descriptions, dimensions and specifications on the complete line of Hobart "Simplified" Arc Welders.

You should have this new Hobart Arc Welder Catalog on file at all times if you're really interested in increasing production and cutting costs. It points out Hobart's exclusive features and advantages for faster welding, so you can compare values before you buy. It will show you how Hobart's advance design and sound engineering makes Hobart welders the choice of experienced weldors and beginners alike.

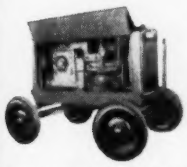
Tear out and mail coupon today for your FREE copy! It will pay you!

HOBART Brothers Company, Box ST-98, Troy, Ohio

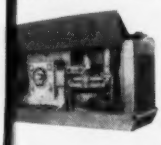
"One of the World's Largest Builders of Arc Welders"



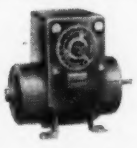
1. Electric drive portable for production, maintenance and general shop welding where electric power is available.



2. Gas engine drive portable arc welder for welding in the field where electric power is not available.

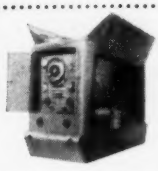


3. Gas drive welder for welding in the field when electric power is not available and at lowest possible operating costs.

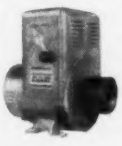


4. "Build Your Own" gas drive arc welder using this generator. Saves you $300 to $500 over cost of factory job.

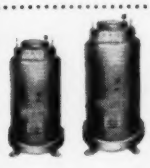
5. A complete portable welding shop with 300 ampere welder and space for oxy-acetylene tanks and equipment. Self-propelled.



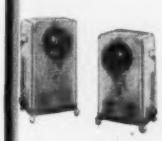
6. Gas drive AC welder and AC power unit combination for welding and operating lights, tools and electric appliances.



7. Furnishes power for welding and power for electric lights, electric tools and emergency stand-by service.

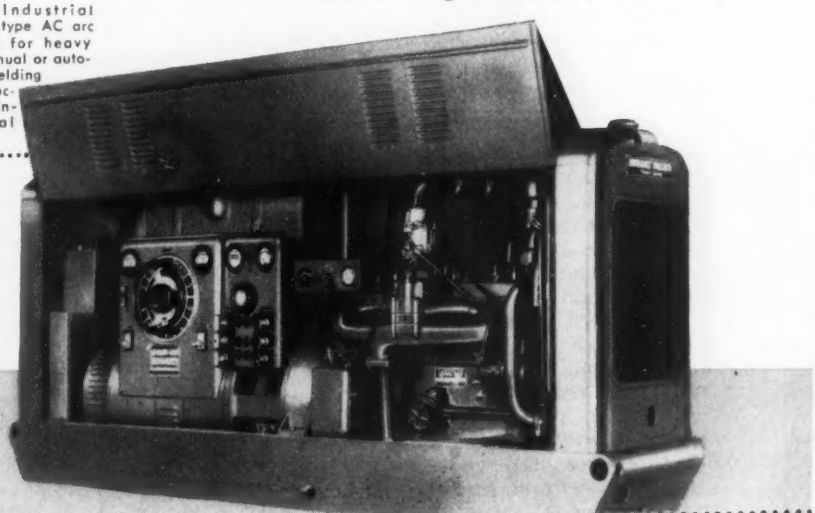


8. Industrial type AC arc welders for heavy duty manual or automatic welding on production in industrial plants.



9. AC transformer welders for shops with only single phase, 220 volt power supply. Power factor corrected for rural lines.

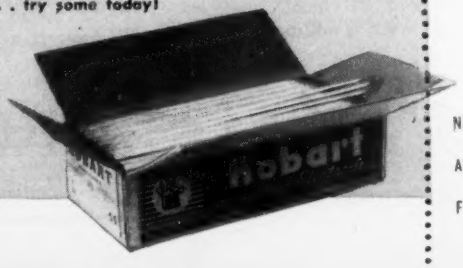
10. Gas drive welder with auxiliary AC power for heavy duty welding and power requirements in the field.



Hobart
the arc welders with **Remote Control**

Have you tried the new Hobart No. 13 electrode? If not, you had better check the coupon for samples today and try them on your light gauge mild steel welding. Low penetration, ease of handling and steady, uniform transfer of metal all contribute to make this electrode faster than any other for out of position welding on light sections of mild steel to heavier ones. Designed for DC straight polarity or AC . . . try some today!

Next time . . . try HOBART Electrodes. They're really better!



HOBART BROTHERS COMPANY, BOX ST-98, TROY, OHIO

Please send **Free** *the new Hobart Arc Welder Catalog, without obligation.*

also send information on item numbers circled 1 2 3 4 5 6 7 8 9 10
and send some samples of Hobart No. 13 electrode in _____ *diameter.*

NAME _____

ADDRESS _____

FIRM _____

Behind the Scenes...

Vacating Is All

Came back in here this morning, vacation over, all ready to work, fresh from vacation, rested, and all the things you are supposed to be after a vacation. Things looked just about the same, except for the pile of papers which had been building up on the desk, and the worn and haggard look on the boss, who has been steaming this column out for the past couple of issues. Sat down at the typewriter, all set to whip out some deathless prose for the finest readers in the world (that's you, of course). The words started to flow out in fine shape, until we took a quick glance at the paper. No words were there. We tried again, but still nothing happened! Finally we lifted the lid of the buzz-box and looked inside. Horrors! Sabotage! No ribbon was there! We called for help, which came with a new ribbon, installed same, and left. We tried again. Now things were nice and black, so after a few "now is the time" trials, we started again. After the first sentence, things started to disappear again. At that we gave it up as a bad job, called the vice-president in charge of typewriters, and decided to go back home for another vacation. Unfortunately, the boss saw us sneaking out and we are now chained to the desk for another year. Well, it was good fun while it lasted, and what if we didn't get the kitchen painted? Maybe we can do it some weekend before the little woman goes on strike.

How's Your Combustion

Do you feel warmer after reading STEEL? If so, our editors and advertisers are probably doing a good job, according to a well-known magazine analyst. This learned man says that when a magazine meets specific needs of its readers, it generates what he calls "reader heat". We modestly hope all you good folks out there will have reduced fuel bills this winter as a result of concentrated reading of our magazine every Monday throughout the winter. We are going to have to do something about those summer Mondays, though.

Do You Spell Bad?

What would you do if your kids came running in the house yelling at the top of their lungs, "Hurray, the psoloquoise is coming to town!" You'd probably think nothing of it, actually, because a psoloquoise is really nothing more or less than a circus. At least that's the way Falk Johnson, instructor in English at Northwestern University, explains it. Johnson feels that the English language needs some streamlining, to which we'll agree, but we lose him temporarily when he goes on to explain that psoloquoise is the way to spell circus just as it sounds. The First "C" is pronounced like the "PS" in psychology; the "IR" like the "OLO" in colonel; the second "C" like the "QU" in bouquet; and the "US" like the "OISE" in tortoise. He furthermore says that a half billion man years of effort are lost each generation in learning English spelling, which practically makes us gasp. Why that's a piker's estimate. We've lost that much ourselves trying to get our two older kids through "Spelling" after having learned to read in the modern manner. Psum phugn!

The Whole Works

The October 18 issue of STEEL will feature the 30th National Metal Congress and Exposition, which this year will be held in Convention Hall, Philadelphia, where you spent several hot evenings by remote control last June. As is our custom a letter went out a couple of weeks ago to all of our good advertisers and the few remaining prospects that we have pointing out the advantages of being represented in this particular issue. One of the missiles was addressed to J. A. Greer of the Taylor Forge & Pipe Works, Chicago, and the stenographer, who was probably wondering what Robert Mitchum was really like at the time, gave Mr. Greer the title of "Adv. Works". But there's nothing slow about Brother Greer. Back he came in a flash with a note betting that we tell that to all our prospects. And we do. For instance, right now we're telling them with a brand new booklet called, "How STEEL Makes Your Advertising Dollars Worth More!" If you'd like a copy, let us know.

Last Answer

The boss did a noble job while we were relaxing, but he says he won't have anything to do with puzzles, which is probably the reason he didn't answer the last one we printed. It was about the price of some gears, remember? Anyhow, H. C. Osborne of Racine, Wis., sent in the right answer, which was 439 sold in county A and 937 in county B, with a selling price of $8.87.

Shrdlu

(Editorial Index—page 57)

STEEL

Vol. 123—No. 12 September 20, 1948

BUSINESS STAFF

GEORGE O. HAYS
Business Manager

ADVERTISING

R. C. JAENKE
Advertising Manager

C. H. BAILEY
Service Manager

A. V. ANDERSON
Production Manager

New York:
E. W. KREUTZBERG, K. A. ZOLLNER
Pittsburgh:
S. H. JASPER, B. C. SNELL
Chicago:
L. C. PELOTT, V. G. BRETTMAN
Cleveland:
D. C. KIEFER, H. G. ROWLAND
Los Angeles:
F. J. FULLER

•

CIRCULATION AND MARKET RESEARCH

J. W. ZUBER
Director
R. L. HARTFORD
Research Manager
H. E. METZNER
Circulation
G. R. EBERSOLE
Mail & List Service

Field Representatives:
C. A. PRICE, H. R. DUNNE, D. G. HEWITT
W. L. POLAND, CALVIN FISHER, JR.
B. W. SCHEINERT

•

MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICE

New York 17 ..... 16 East 43rd St.
Murray Hill 2-2581
Chicago 11 ..... 520 North Michigan Ave
Whitehall 4-1234
Pittsburgh 19 ..... 2806 Koppers Bldg.
Atlantic 3211
Los Angeles 4 130 N. New Hampshire Ave.
Fairfax 1758
London: 2 Caxton St., Westminster, S.W.1

• • •

Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio. E. L. SHANER, President and Treasurer; G. O. HAYS, Vice President and General Manager; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Controlled Circulation Audit, Inc.; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1948 by the Penton Publishing Co.

Editorial Staff on Contents Page

ABC ABP CCA

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

IRWIN H. SUCH
Editor

WM. M. ROONEY
News and Markets Editor

JAY DEEULIS
Engineering Editor

J. D. KNOX — *Steel Plant Editor*
GUY HUBBARD — *Machine Tool Editor*

DON S. CADOT
Art Editor

ALLEN G. GRAY
Consulting Editor

ASSOCIATE EDITORS

W. J. CAMPBELL • FRANK R. BRIGGS
VANCE BELL • WALTER F. TOERGE
DAN REEBEL

ASSISTANT EDITORS

H. C. TUTTLE • DOLORES K. BLAHA
HENRY J. HOLTZ • L. J. SKUDERIN
JOHN S. MORGAN • M. T. BORGERHOFF
EDWIN L. KARPICK

RESIDENT EDITORS

E. C. KREUTZBERG
Washington Editor

B. K. PRICE
Eastern Editor, New York

L. E. BROWNE
Associate Editor, New York, Boston

J. C. SULLIVAN
Pittsburgh Editor

E. F. ROSS — *Chicago Editor*
A. H. ALLEN — *Detroit Editor*

VINCENT DELPORT
European Editor, London

EDITORIAL CORRESPONDENTS

R. W. KINCEY, *Birmingham*
L. C. FELDMANN, *Buffalo*
SAMUEL S. CARR, *Cincinnati*
MAC HUTCHENS, *St. Louis*
GEORGE R. REISS, *Youngstown*
MAURICE BEAM, *Los Angeles*
ROBERT BOTTORFF, *San Francisco*
R. C. HILL, *Seattle*
C. K. CATES, *Dallas*
F. S. TOBIN, *Toronto*
J. A. HORTON, *Birmingham, Eng.*
LEON JAUDOIN, *Paris, France*
JACQUES FOULON, *Liege, Belgium*

MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICES

New York 17 ..... 16 East 43rd St.
Murray Hill 2-2581

Chicago 11 ..... 520 North Michigan Ave.
Whitehall 1234

Pittsburgh 19 ..... 2806 Koppers Bldg.
Atlantic 3211

Detroit 2 ..... 6560 Cass Ave.
Madison 3024

Washington 4 ..... 1123 National Press Bldg.
Executive 6849

Los Angeles 4 ..... 130 N. New Hampshire Ave.
Fairfax 1758

London ..... 2 Caxton St., Westminster, S.W.1

Business Staff on Page 4

NEXT WEEK . . .

"Flow-Production" Processing Minimizes Huge Part Movement

Fundamentals of Forging Practice—Part IX

Tool and Die Materials—Selection, Application—Part VI

New Plant for Manufacturing Basic Refractories

STEEL

The Magazine of Metalworking and Metalproducing

VOL 123, NO. 12 SEPTEMBER 20, 1948

NEWS

★ As the Editor Views the News 59
News Summary 63
Fuel, Power Outlook Fair 65
Peacetime Renegotiation Opposed 67
Tempest Over Blast Furnace 68
Pricing Policy Problems Probed 69
Steel Distribution Investigation Launched 69
Sight Peacetime Record for Steel Production 70
Europe's Politics Delays Recovery 71
★ Calendar of Meetings 71
★ Windows of Washington 72
Unveil British Machine Tools 75
Taft-Hartley Test Lies in Administration 76
★ Mirrors of Motordom 79
Diesel Locomotive Building Booms 82
★ Briefs 83
★ The Business Trend 84
★ Men of Industry 86
★ Obituaries 91
★ Construction and Enterprise 180

TECHNICAL

★ Engineering News at a Glance 93
Bearing and Lubricants Center Analyzes Machinery Problems 94
Iron and Steel Exposition To Feature Postwar Developments 97
Floor Plan of Cleveland Public Auditorium 98
Exposition Program 100
List of Exhibitors 101
New Tonnage Oxygen System Eliminates Hydrocarbons 103
Practical Aspects of Quenching Below Critical Temperature 106
Spring Steels 'Air Fabricated' at West Coast Plant 110
French Heavy Forging Group Holds First Meeting 114
★ Progress in Steelmaking—Evaluation of Strip Plating 116
Unit Casting Cost Greatly Reduced by Automatic Molding 126
Continuous Tunnel Kiln Improves Abrasive Wheel Quality 149
★ New Books 152

MARKETS

★ Market Summary 157
★ Market Prices and Composites 158
Supplies of Copper Increase 162

★ *Index to Advertisers* 188

Editorial Index available semiannually; STEEL also is indexed regularly by Engineering Index Inc., 29 West 39th St., New York 18

★ Denotes Regular Features.

...want more iron or steel?

TURN IN MORE SCRAP!

HERE'S WHAT YOU CAN DO TO HELP RELIEVE THE SCRAP SHORTAGE

1. Put some one individual in charge of scrap in all departments of your business and GIVE HIM AUTHORITY TO ACT.

2. Comb the plant and yards for dormant scrap, abandoned equipment, old boilers, pipe, moulds, obsolete dies and parts, material now wasting away which has salvage value.

Survey all plant equipment, particularly idle stand-by or discarded machines, with a view to scrapping all not convertible to useful production.

Consult your scrap dealer for advice on types, grades and sizes.

3. Segregate each class of scrap and supervise its handling to avoid contamination. This will increase its value. Identify, classify and provide separate containers, clearly marked, for each class of scrap material.

Dismantle discarded equipment promptly into its components—electrical, fastenings, lumber, etc.—so that these parts may be utilized or scrapped.

Sort sweepings and miscellaneous waste to recover scrap values.

4. Constant reminders in the form of posters, illustrations of right and wrong methods, pay envelope enclosures, house organ publicity, etc., are potent aids to the scrap recovery program.

EMBLEM OF INCO SERVICE
TRADE MARK

MORE SCRAP—MORE STEEL
Move your scrap to the mills—
Sell it...ship it...move it now!

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET
NEW YORK 5, N. Y.

September 20, 1948

Promote Them!

During recent years, when so much attention has been directed to what is sometimes called "human engineering," more emphasis has been placed upon the problems of wage earners, foremen and superintendents than upon those of executive personnel. This is logical, yet there is abundant evidence to prove that more attention to the problems of top executives would be profitable to many corporations, regardless of size.

This point is of timely interest because of last week's wholesale reshuffling of top executive personnel in General Motors Corp. The pertinent comment has been made that "these shifts are unique in that there probably is no large corporation in the world sufficiently deep in executive talent at most levels to permit such an extensive grouping of top personnel at one time."

This statement reflects great credit upon the management of General Motors for having positioned good men in posts where they gained the experience which now makes them available for advancement. The current General Motors promotions are especially noteworthy when contrasted with the unfortunate experience of another giant American industrial corporation some years ago.

In this corporation, important top executives had been permitted to hold their jobs long after normal retirement age. Younger men, denied advancement on obvious merit, sought jobs elsewhere. All of a sudden, when the corporation needed vigorous management, it found it had no experienced men to promote. Its chairman was candid enough to refer to the younger aspirants denied the promotions they deserved as the "lost generation." The corporation had to raid competitors to obtain qualified top personnel to carry on its business.

Successes and mistakes of giant corporations are matched ten or more to one by those of smaller organizations. The key to good management is a policy which provides for a healthy flow of executive personnel upward. It calls for a sensible balance between the experience and judgment of veterans and the vigor and enthusiasm of youth. This in turn demands a practical system of retirement for the elderly and promotion on merit regardless of obstacles for the young.

Beware of a corporation in which top executive personnel seems to have a life-long tenure on jobs. This kind of an outfit is riding for a fall.

* * *

ABLE MEN ON BIG JOB: George M. Humphrey, John L. McCaffrey, Gwilym A. Price, Frederick V. Geier and Charles E. Wilson, presidents respectively of M. A. Hanna, International Harvester, Westinghouse Electric, Cincinnati Milling Machine and General Motors, have been selected to help determine which of Western Germany's industrial plants now scheduled for removal as reparations would, if retained in production at their present sites, be of importance to the European Recovery Program.

Seldom has such outstanding industrial executive talent been packed into a small government mission in peacetime as that represented in this group of five. However, the task assigned to them is difficult enough to challenge their abilities. It is too bad that they, or men of comparable qualifications, were not called upon to

(OVER)

advise on reparations problems three years ago.

We have been following an erratic course in regard to German industry since V-E Day. Our government went into Germany in 1945 with a vague idea of reducing that country's industries almost to the "agricultural state" status advocated by Secretary Morgenthau. Later the plan was modified to pare German industries to dimensions which would provide her with a standard of living not to exceed the average of other European nations, excluding Britain and Russia. That formula has been made obsolete by Russia's refusal to co-operate in the administration of Germany and by ERP.

If Chairman Humphrey's group can come up with the proper solution of the German plant problem, it may well save the United States billions of dollars in Paul Hoffman's ECA.

—p. 72

* * *

NIP AND TUCK ON FUEL: With industry zooming along at an unprecedented pace for peacetime, some anxiety is felt as to whether the nation's supply of power and fuel will be adequate during the difficult winter months. Although the prospect is brighter than anticipated a few months ago, there is a strong possibility that there will be sporadic shortages, particularly of electricity and gas.

Strangely enough, supplies of coal, which have been interrupted so often by strikes, will be adequate for the approaching winter. The outlook for fuel oil is much better than was predicted a short time ago. The pinch, if any, will come in a few areas in electric power and in natural gas. However, most of the electric and gas utility companies have gone to extraordinary measures to meet contingencies. —p. 65

* * *

DIFFICULT DECISION: Apparently the leasing of the Republic No. 5 blast furnace and nearby coke plant to Kaiser-Frazer by WAA is not destined to go unchallenged. Wheland Co., operator of a large production foundry in Chattanooga, has entered the lists with a bombast against "secret" deals by WAA and an offer to lease the property for $100,000 more than the annual rental asked by WAA from K-F.

The bizarre developments in this case are the natural aftermath of wartime expediency. The plant was built to augment production by Republic Steel. The logical postwar purchaser would be Republic. Republic's interest is to buy as advantageously as possible. WAA's job is to sell at the highest figure obtainable. In their efforts to outsmart each other, both principals overplayed their hands.

The ensuing furor makes it necessary for somebody in Washington to make a difficult decision. —p. 68

* * *

CLARIFICATION NEEDED: As the Senate Trade Committee prepares to study the effect of pricing systems upon the business of consumers, it is becoming increasingly likely that Congress may be called upon to clarify the uncertainty that has arisen from recent Supreme Court decisions and Federal Trade Commission rulings.

Chairman Senator Capehart points out that on three occasions between 1936 and 1940, FTC asked Congress to outlaw freight absorption. Each time Congress refused. Senator Capehart believes Congress "cannot continue to avoid responsibility on this important question."

The committee's general counsel, William Simon, points out that FTC has established no rules defining what pricing policies will be considered "unfair" and does not propose to do so. Thus no one knows whether a practice is legal or illegal until FTC or Supreme Court rules on it.

Pricing is important enough to warrant a decision by the body elected to write the laws of the land. —p. 69

* * *

IRON AND STEEL SHOW: One of the early important events in the forthcoming fall convention season is the annual meeting of the Association of Iron & Steel Engineers and the Iron & Steel Exposition to be held in Cleveland Sept. 28-Oct. 1. Four full days will be devoted to technical sessions at which more than 40 papers will be presented and discussed. The show will consist of exhibits of new equipment and processes sponsored by 134 companies.

The 1948 event promises to attract a large attendance, partly because the exposition will afford exhibitors an opportunity to display postwar improvements which were not sufficiently developed to be shown at the last show in 1946.

The Cleveland convention and show—a "must" for iron and steel engineers—should also appeal strongly to operating personnel, suppliers and many others identified with the industry.

—p. 97

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

PRICING— Congressional action to clarify the pricing muddle resulting from the Supreme Court's cement case decision is suggested by Senator Capehart in launching a full-scale investigation of the entire pricing situation (p. 69). The committee's spokesmen are somewhat critical of the Federal Trade Commission for putting into effect a new pricing policy without benefit of law.

GIGANTIC STEEL STUDY— Questionnaires asking "where," "how much," and "to whom" steel is being distributed have been sent to 15 steel companies producing 80 per cent of the country's steel by a congressional committee (p. 69), investigating distribution practices. If the information is obtained, the committee will have the first fairly complete picture of the geographical distribution of steel products, as well as the amounts sold by the producers to affiliated companies.

FUEL, POWER FOR WINTER— Industry's prospects for an adequate supply of power and fuel for the winter months is somewhat better than a year ago, although some shortages are expected to develop (p. 65). Electric power demand at times will exceed supply, especially in the north central area. Some power companies have mapped out a co-operative program for sharing the load which is expected to alleviate the shortage. Natural gas may be short during periods of extreme cold when domestic requirements are high. Supplies of coal and fuel oil are higher and these fuels should not cause trouble.

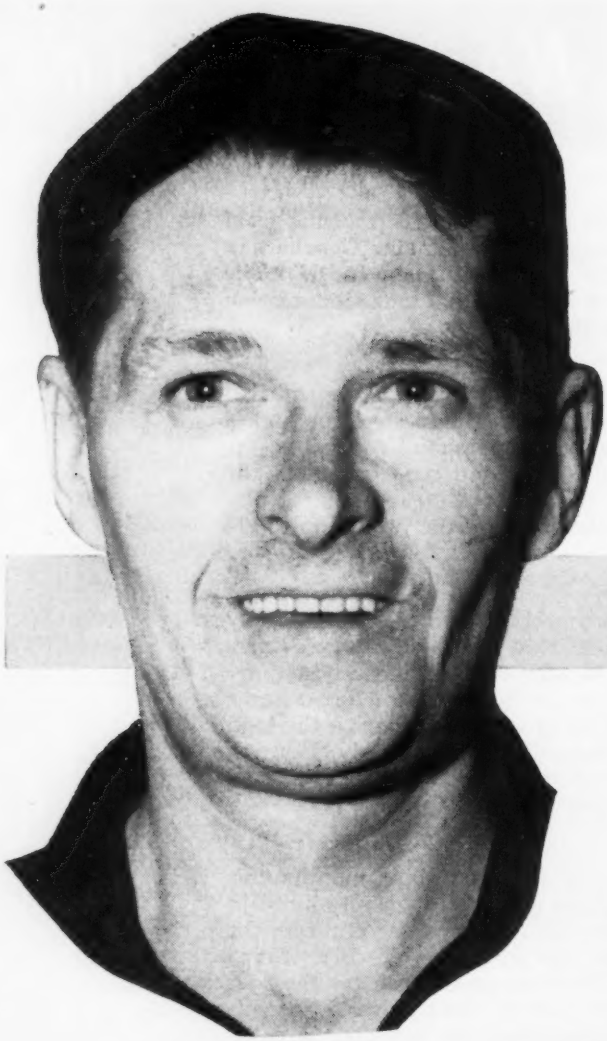
HEADING FOR RECORD— Steel production for the first eight months this year exceeds 57.5 million tons, about 1,645,000 tons more than was produced in the comparable 1947 period. Barring unforeseen interruptions, ingot output for the year should reach 87 million tons, a record for peacetime (p. 70). Shipments of finished steel are keeping pace with raw steel production for the first seven months; 1.3 million more tons of steel products were shipped to consumers than in the like period a year ago. Gratifying are increases in cold-rolled sheets, pipe and tubes and other products in especially tight supply.

ALLOCATIONS— Proposed programs being considered by the Office of Industry Cooperation aggregate 150,920 tons of steel monthly (p. 70), in addition to the requirements of the ten programs already approved and effective for the fourth quarter.

PREPAREDNESS— Renegotiation in peacetime is opposed by nine out of ten business executives (p. 67). But if war came again, only four out of ten would oppose the practice . . . Machine tool builders will hear details of the "phantom order" program this week (p. 67) . . . Seekers of defense contracts are advised to get in touch with the field offices of the three military branches (p. 67).

TAFT-HARTLEY— Test of the 13-month-old Labor Management Relations Act lies in the administration and interpretation of the law by the National Labor Relations Board (p. 76). This is the conclusion of those who have watched developments under the law during its first year of operation. A prolabor administration could largely nullify the intent of Congress; an antilabor administration could make the act unduly restrictive. To date, administration has been fair, although many important questions remain to be answered.

HERE AND THERE IN INDUSTRY— Republic Steel soon will start experimental rolling of billets produced by the recently-announced continuous casting process (p. 70) . . . American Locomotive (p. 82) expects to build $1 billion of diesel-electric locomotives in the next decade . . . Europe's local politics is playing against long-term recovery, through application of recovery funds to immediate relief rather than to increasing productive capacity (p. 71), says a leading machine tool builder . . . Controversy over the lease of the government-owned blast furnace to Kaiser-Frazer is boiling again, with a large southern foundry challenging the legality of the transaction (p. 68).



"I like the UNIFORMITY of Inland Steel"

THE MEN WHO WORK WITH

INLAND STEEL KNOW ITS QUALITY!

Operators of forming rolls know that the steel they process must have a uniform temper—strong enough to do its job, yet ductile enough to fabricate without fluting. That's why they prefer Inland Steel. Uniform sources of raw materials . . . uniform steelmaking procedures using the same modern equipment . . . uniform workmanship—made possible by Inland's completely integrated, closely knit plant—explain why the Inland steel received today will be of the same uniform quality as that received last month . . . or last year.

INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND STEEL

OTHER PRODUCTS: BARS • STRUCTURALS • PLATES • STRIP • TIN PLATE
FLOOR PLATE • PILING • RAILS • TRACK ACCESSORIES

STEEL
A PENTON PUBLICATION

Power, Fuel Outlook Fair

Industry's supplies will be better than last year, although occasional shortages may develop in electric power and gas. Coal and fuel oil stocks good

INDUSTRY'S outlook for power and fuel supplies for the approaching winter is in some respects brighter than that of a year ago, but absolute freedom from occasional shortages, particularly of electricity and gas, cannot be expected.

With industrial activity at high levels, industry's consumption of power and fuel continues commensurately high. When the power and fuel needs due directly to winter are added, the burden upon power and fuel suppliers will in some instances be critical despite efforts to expand supplies. While substantial programs are under way to increase capacities of electricity and gas systems the progress has been limited to the amount of steel and generating equipment available, and all the while demands for power and fuel have been growing.

What may be expected concerning supplies of electricity, gas, fuel oil, and coal during the coming winter follows:

Electric Power

THERE will be a nip-and-tuck race between demand and supply until at least the end of December, particularly in the north central states industrial area.

Seriousness of the inadequacy of capacity to meet peak loads was emphasized recently at Chicago when weather conditions, combined with heavy industrial and commercial consumption, pushed electric power demands beyond generating capacity. The additional load came on a workday morning from usage of electric lights and air conditioning units during a period of heavy overcasts and a high humidity. To cope with the emergency, the electric power company asked 35 large industrial and commercial users of electric power to cut down as much as possible on the use of electricity.

In an attempt to prevent future recurrences of such an emegency, the electric power company is reported setting up a program under which large users of electricity will reschedule operations to spread demand over a wider period and thus reduce peak demands.

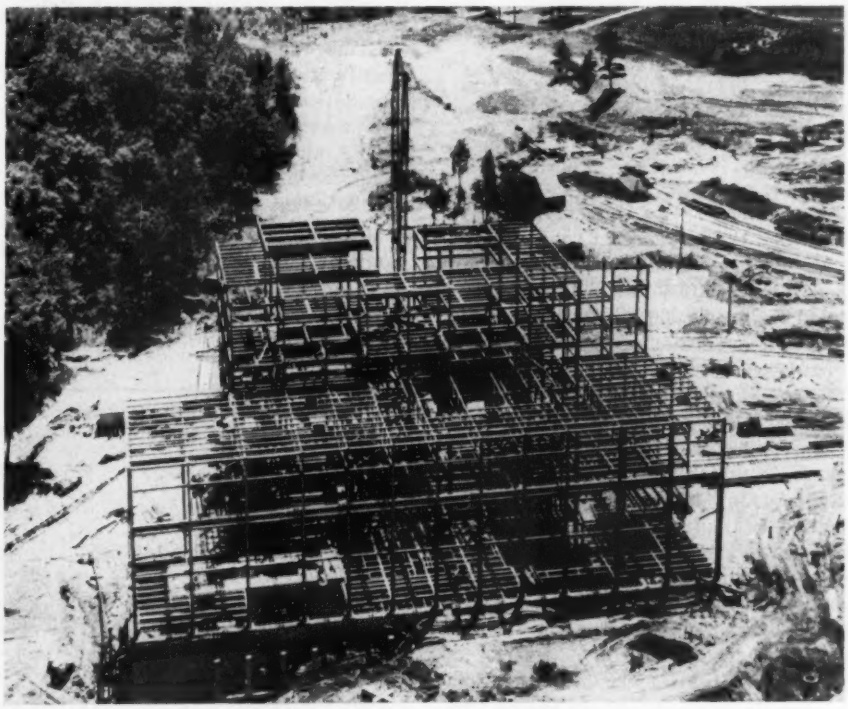
Co-operative Program—A similar program already is in operation in the important industrial area of Ohio, western Pennsylvania, Indiana, West Virginia, northern Kentucky and a portion of Virginia. Principally to prevent interruptions to the metal-producing and metalworking industry the electric power companies in that several-state region have on their own initiative revived and refined a wartime program of co-operation.

That program has two aims: 1. Shifting of power, when possible, from areas of surplus to areas of shortages; and 2. inducing industry to shift production so as to reduce peak demands on electric power systems.

Under aim No. 1, the electric power companies in the entire area have interconnected their distribution systems so that supply can be shifted where it is needed. Thus, if demands are particularly heavy on one power company's system it can draw upon any surplus that might exist on another system. Ability to draw upon one another for assistance also gives each company protection in event of equipment breakdown.

Lower Peak Loads—Under aim No. 2, the electric power companies have devised a program of 20 ways to schedule industrial operations to reduce power loads 15 per cent between 8 a.m. and 8 p.m. Mondays through Fridays from Sept. 1, 1948, to May 1, 1949. The participating electric companies feel that if peak loads can be cut 15 per cent and the consumption spread out into present non-peak periods there will be adequate power for full industrial activity.

The first 11 points of the 20-point program are: 1. Increase production on second and third shifts; 2. shift some operations to Saturdays and Sundays; 3. avoid scheduling both production and maintenance work during same peak load hours; 4. schedule all testing for off-peak



Requiring substantial amounts of steel and equipment, the electric power industry has under way a huge expansion program, one of its many projects being this new electric plant being built at Gadsden, Ala., by the Alabama Power Co.

hours; 5. utilize all mechanical drives and steam compressors; 6. avoid operation of air conditioning equipment during peak load hours; 7. schedule water heating and degreasing operations for off-peak hours; 8. schedule additional new equipment operations for second and third shifts; 9. use electric handling equipment for storing materials in off-peak hours; 10. reduce lighting in aisles, storage and garage areas to only that needed for safety; 11. operate heating equipment before arrival of day shift, then shut off during forenoon hours.

The remaining nine points request rescheduling of the following to off-peak hours: 1. Heat treating, infrared or other electric baking, plating and polishing, compressor and other light motor loads, grinding, mixing, pumping, melting, and machine shop operations such as upsetting, stamping, forming and milling.

Demand High—Although the aggregate productive capacity of the nation's electric power plants is greater than ever before and still growing, demands likewise have been consistently at new high levels. The electric industry's capacity in July was 54,293,205 kilowatts, a 7 per cent increase over that of the corresponding month of 1947. However, percentagewise the increase in consumption was even greater, for the amount generated in July for public use totaled 23,282,055,000 kilowatt hours, 12 per cent over that of the like month in 1947.

Even though electric power producers have a gigantic expansion program under way the supply-demand pinch in which they find themselves stems from the peacetime concentration of high industrial production into a relatively short period of a day. During the war, much of the industrial load was distributed over a 24-hour period. Another factor contributing to the pinch has been the acceleration of the electrification of industry during and following the war. Much of the recent increase in the use of electric power represents the cumulative effect of improved processes and the continuing extension of manpower by electric equipment in the factory, in the home, and on the farm.

Natural Gas

INDUSTRY is not "out of the woods" yet as far as its gas supply is concerned. Although the total supply is up, demand is up also, with a result the margin of supply over demand remains insufficient to rule out the probabilities of restrictions on industrial usage during severely cold weather when needs of home heating are at peak levels.

Big programs to increase facilities for carrying gas into the areas of need have been under way but they have been limited by the amount of steel pipe available for such purposes.

Indicative of the growth in demand, industrial and commercial customers, who account for the bulk of natural gas consumption, numbered 784,000 at the end of the fourth quarter of 1947, compared with 661,000 at the corresponding time of 1946. Industrial and commercial consumption in the last quarter of 1947 totaled 452,909,000,000 cubic feet, against 400,202,000,000 cu ft in the like period of 1946.

Coal

INDUSTRY appears to be in good position as far as coal supply is concerned. Industrial stocks of bituminous and anthracite in the United States and Canada on Aug. 1 totaled 65½ million tons, an increase of one million tons over the preceding month and 15 million tons over the like date a year ago. This gave the two countries a 59-day supply on Aug. 1, an increase of three days over the preceding month and 15 over the like date last year.

Meanwhile, consumption of bituminous and anthracite in the U. S. and Canada in July amounted to 34½ million tons, a decrease of a third of a million tons from June, and three-fourths of a million tons less than in July, 1947.

With U. S. production of bituminous coal currently around 12½ million tons a week, it is considerably easier to obtain.

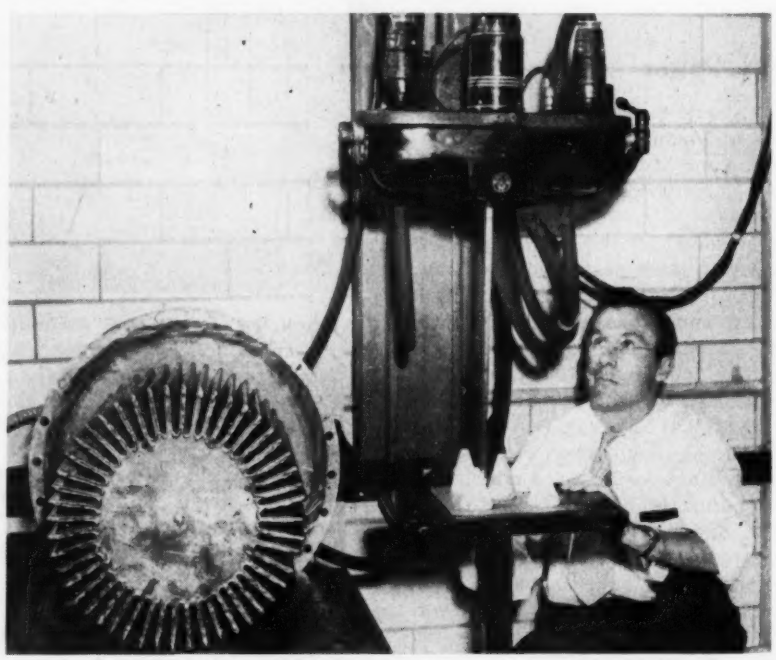
Fuel Oil

PROSPECTS for industrial fuel oil supplies for the coming winter are brighter than at any time since the war. During the first week of September, stocks totaled 72,308,000 barrels, compared with 70,853,000 bbl a week earlier, and only 57,211,000 bbl during the first week of September, 1947. The current high level of stocks reflects record production of crude oil.

How deeply stocks will be cut into during the winter depends to some extent on whether severe weather and natural gas shortages will necessitate curtailments of industrial usage of gas, thereby causing industries to fall back onto standby oil facilities in order to maintain operations.

Reports on Trucking Industry

DESCRIBED as the most comprehensive appraisal of the motor trucking industry made in recent years is a report in the latest quarterly issue of "Industry Report on Domestic Transportation" issued by the Department of Commerce.



SEEK NEW X-RAY APPLICATIONS: A major project of the new General Electric x-ray development laboratory, dedicated at Milwaukee Sept. 13, is exploring proposed applications for x-ray in industry. Here an employee sets up a 140,000-volt unit for inspection of plastic parts. At left is a heat exchanger, also to be studied for inspection feasibility

Peacetime Renegotiation Opposed

Industry executives believe adjustment practice might discourage acceptance of defense orders. Some believe it necessary during wartime

NINE out of ten business executives oppose renegotiation of defense contracts in peacetime.

But if war came again, only four out of ten would object to renegotiation.

Such are the findings of a survey by the National Industrial Conference Board, New York.

Opponents of renegotiation in peacetime base their objections on the ground that: 1. It is unnecessary and impractical to expend great sums to establish a renegotiation staff; 2. they are "not in favor of placing so much power" in the hands of an administrator; 3. renegotiation penalizes the person who cuts down his normal business in order to supply defense materiel; 4. the law of supply and demand will give the government the best price; and 5. renegotiation might "keep costs high and even provide an incentive to avoid accepting defense work contracts."

The 10 per cent favoring peacetime renegotiation think it is necessary to alleviate public resentment toward possible profiteering. However, they feel peacetime renegotiation should be limited to noncompetitive and nonstandard products on which it is difficult to make accurate cost quotations.

Many of the executives opposing renegotiation during wartime express the same views as those who do not agree to it during peacetime. Generally, they feel renegotiation is not necessary and that properly established and equitable tax laws should be relied upon instead.

Although about six out of ten industrialists accept wartime renegotiation, they do not like it but have reconciled themselves to the necessity of such a practice. However, the majority agree that it is justified on new projects where there are likely to be high fixed prices evolving out of the inability to make accurate cost estimates and where there are likely to be constant engineering changes.

Speeds Up Plane Procurement

TO SPEED UP its acquisition of new planes, the Air Force is planning expenditure of an additional $243,100,000.

The funds are being allocated from unexpended congressional appropriations. An allotment of $43,500,000 already has been made for tooling of existing aircraft producing facilities, another $103,600,000 for purchase of 213 additional fast jet fighters and long-range bombers with conventional engines has been approved by the Secretary of Defense and forwarded to President Truman for approval, and the Air Force has asked for allotment of $96 million for purchase of trainers and helicopters and the start of production of the new Boeing XB-47 six-jet engine bomber.

Where To Get Contracts

REQUESTS for information as to where to go for national preparedness contracts continue to be received by STEEL.

Field offices of the National Military Establishment's three branches —Army, Navy, and Air Force—are doing most of the procurement work. Addresses of their respective field offices can be obtained from the Air Force Procurement Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, O.; Navy Bureau of Supplies and Accounts, Washington 25; and Army Current Procurement Branch, General Staff, Washington 25.

Machine Tool Group To Meet

SEVERAL important matters will be taken up at the meeting of the Munitions Board with its Machine Tool Industry Advisory Committee on Sept. 24. The committee will be given a detailed report on the machine tool reserve of the armed services, and manufacturers will be sounded out as to whether they would be willing to give the services complete drawings, specifications and other data for use in making necessary repairs and replacements to bring this equipment up to "as new" condition.

The manufacturers also will be informed in detail about the "phantom order" program under which paper orders will be placed with the machine tool builders for conversion into actual orders by telegraphic instructions in the event of war. Such "phantom orders" are to be placed in the next few weeks with practically all machine tool builders.

The committee also will be asked for advice on the formation of a proposed new Industrial Equipment Industry Advisory Committee to cover these classes of products: Ovens, furnaces, woodworking machinery, foundry equipment, welding equipment, tools and dies, cutting tools, and metal forming and shaping equipment.

The following have been invited to become members of the Machine Tool Industry Advisory Committee: Ray H. Sullivan, vice president, E. W. Bliss Co., Detroit; R. T. Hurley, vice president, Ford Motor Co. Detroit; and Phil Huber, president, Ex-Cell-O Corp., Detroit.

Gets Ammunition Contract

CONTRACT for re-establishment of a pilot line to produce 50-caliber ammunition has been placed by the U. S. Army Ordnance Department with Remington Arms Co. Inc., Bridgeport, Conn. This is the first contract Remington has received for military production since the end of the war.

Remington will tool up and manufacture a limited amount of such ammunition and train a small nucleus of personnel who would qualify as supervisory foremen for the company should it be called upon for volume production in the future.

Machinery and equipment required for the line are to a large degree to come from ordnance storage plants.

Air Force Strength Grows

STRENGTH of the U. S. Air Force grew from 311,000 officers and enlisted men and women to 400,000 during the year ended Sept. 18, first year Air Force has been one of three co-equal military services. Approximately 130,000 of the personnel are stationed overseas.

Ceiling of the Air Force strength was raised during the last year by Congress from 401,000 to 502,000. The Force also was authorized to accept up to 15,000 18-year-old volunteers for one-year terms of enlistment. However, budget limitations will restrict the ultimate personnel ceiling to 444,500 during the fiscal year ending next June 30. Consequently, the Force is planning on a man-year average of only 416,000 this fiscal year.

13 New Planes Introduced

THIRTEEN new models of aircraft were introduced by the United States Air Force during the year ended Sept. 18, the Air Force's first year as one of three co-equal military services.

Included among the Air Force's accomplishments in that period are development of a parasite jet-fighter, flight of the world's largest transport

plane, and addition of several types of high-speed fighters and jet bombers. Numerous modifications have been made on existing aircraft and aircraft engines as a result of the Air Force's research and development program, and a USAF flying laboratory has penetrated the sonic barrier, marking the first time that man has flown faster than the speed of sound.

Simplification Studied

STEPS to simplify the problem of spare parts supply and maintenance for industrial engines used by the Army, Navy and the Air Force are being taken.

Working on the task is the Munitions Board Industry Advisory Committee for Industrial Engines. The ten-member committee was formed as part of the Munitions Board overall program of simplification of equipment used by the three services. It is anticipated that simplification also would facilitate industrial mobilization within the industrial engine industry.

Chairman of the committee is Charles E. Nelson Jr., assistant to the president, Waukesha Motor Co., Waukesha, Wis.; vice chairman is H. W. Smith, manager, Engine Sales Department, Caterpillar Tractor Co., Peoria, Ill.; and secretary is G. Wayne Thomas, chief automotive engineer, Continental Motors Corp., Muskegon, Mich.

Other seven members of the committee are: J. F. Bachman, director, Industrial & Marine Engine Sales Department, Ford Motor Co., Dearborn, Mich.; C. W. Balough, president, Hercules Motor Corp., Canton, O.; Edward V. Oehler, vice president, Briggs & Stratton Corp., Milwaukee; W. M. Parrish, assistant sales manager, International Harvester Co., Chicago; E. J. Schwanhausser, vice president, Worthington Pump & Machinery Corp., Harrison, N. J.; J. G. Rayniak, Outboard, Marine & Mfg. Co., Milwaukee; and J. M. Crawford, vice president, General Motors Corp., Detroit.

Tempest Over Blast Furnace

Chattanooga foundry, bidder for government-owned Cleveland plant, challenges legality of lease to Kaiser-Frazer. Asks Justice Department to nullify transaction

CONTROVERSY over the lease of government-owned $29 million Cleveland blast furnace plant to Kaiser-Frazer Corp. continues to boil vigorously. The stack and coke plant, built by Republic Steel Corp. in 1943 for government account and operated by that company since, has been the center of a bitter fight since Aug. 17 when the War Assets Administration leased the facilities to Henry J. Kaiser's automaking company.

Latest attack on the lease was launched by the Wheland Co., large production foundry of Chattanooga, Tenn. Wheland last month offered to lease the blast furnace plant for $100,000 more than the annual rental asked by WAA from Kaiser-Frazer. Wheland's president, Gordon P. Street, charges that the transaction with Kaiser-Frazer was closed without adequate notice to his company and is asking the Department of Justice to nullify the K-F lease. Advertisements by the Wheland Co. currently are appearing in metropolitan newspapers and magazines (see pp. 122, 123).

Called "Surprise Deal" — Wheland charges that it approached WAA three times during July and early August about the possibility of leasing or buying the stack and coke ovens but was told by WAA that no action would be taken for 60 to 90 days. The latest contact by Wheland with WAA was on Aug. 16, the same day WAA offered the plant to K-F.

The Wheland advertisements ask foundries, castings users and others interested to "insist that this lease be canceled and that such government property be offered equally to all bidders who are interested in acquiring this property and operating it for the benefit not only of their interest but in the interest of the nation as a whole."

Wheland says it is acting entirely in its own behalf and is not "representing Republic Steel or any other party." The company says it is completely independent and Chattanooga-owned, has "no connection with any other company anywhere."

Kaiser Fires Back — The Wheland advertisements brought Mr. Kaiser out fighting. In a bristling statement, he appealed to two congressional committees to reopen investigations immediately and to "crack wide open the conspiracy by powerful persons and interests to make a scrap of paper out of the government's binding lease." Wires were sent by Kaiser to Sen. Kenneth Wherry, chairman of the Senate Small Business Committee, and Rep. George Bender, head of a House subcommittee on executive expenditures, saying that Republic Steel had served written warning "that it proposed to contest legally or otherwise our acquisition of the Cleveland plant."

"Only testimony under oath can reveal what parties are paying for a pressure drive of falsehoods and political maneuvering and exactly who is being paid," said Kaiser. He asked the committees to subpoena Mr. Street and called the Wheland company's action a "smokescreen" for Republic Steel.

Hearings To Be Reopened — Prior to Kaiser's blast, Representative Bender had announced his committee would reopen hearings on the circumstances surrounding the lease within the next week or two. Bender charged that WAA had misled the Wheland company by advising them there was no hurry about the blast furnace negotiations. He also expressed concern over the plight of several hundred foundries which have been obtaining pig iron from Republic Steel. Currently the blast furnace is being operated by Republic under agreement with K-F, but this agreement expires April 30.

Bender has called upon the attorney general for a full report on the Justice Department's position in regard to the legality of the deal.

As matters stood late last week, WAA had finally approved the 20-year lease to K-F, but approval of the Justice Department is necessary for final clearance.

Meanwhile the blast furnace continues to produce basic iron, under the short-term agreement between Republic and K-F, with the latter company obtaining up to 5000 tons of iron monthly. By operating the furnace Republic is able to divert foundry iron from its other furnaces to supply its merchant iron customers.

Personnel Management Training

INSTRUCTION in the practical operating problems of personnel management will be offered in an evening course at Fenn College, Cleveland, beginning Sept. 23, and continuing for two terms of 18 weeks each until June 16, 1949. Admission will be by approved application and the course is designed for persons with one or more years experience as staff members of a personnel or a related department. Various sessions, during the course, will be conducted by key personnel and industrial relations executives of co-operating Cleveland companies and organizations.

Pricing Policy Problems Probed

Senator Capehart says legislation may be necessary to clarify situation. Charges Federal Trade Commission effected new pricing method without benefit of law

CONGRESSIONAL action to clariify the uncertainty over what pricing policies business and industry may follow was hinted last week by Sen. Homer E. Capehart (Rep., Ind.).

The hint was dropped as the Senate Trade Policies Committee launched its study into the pricing situation by calling a meeting of its 46-man advisory council to sift the various problems involved.

Senator Capehart pointed out that on three occasions between 1936 and 1940, the Federal Trade Commission asked Congress to outlaw freight absorption and on each occasion Congress refused. "Congress cannot continue to avoid responsibility on this important question," Senator Capehart said, adding that Congress should now "determine what is best for the nation and put it into law."

Study Four Questions—Senator Capehart made it clear the committee is not interested in defending any pricing policy adopted through conspiracy or forced on buyers, but that it is interested in ascertaining what pricing policies bring about the following results:

1. Foster and promote competition in industry and advance the free enterprise American way of business life.

2. Promote a beneficial decentralization of industry in the furtherance of our national security.

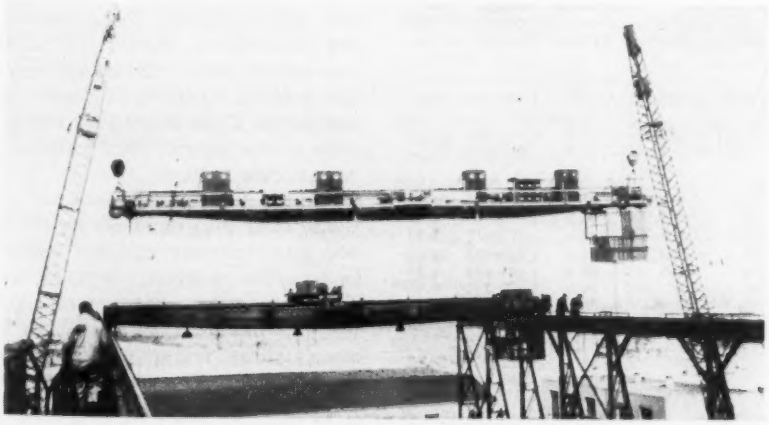
3. Encourage favorable prices to consumers on manufactured articles they buy.

4. Cause shifts in population which will materially affect the nation.

Rule Without Law—Senator Capehart said the Supreme Court decision in the cement case and its application by the lower courts and the FTC have put a new pricing policy into effect without legislation by Congress.

Whereas Federal Trade Commissioners have claimed that outlawing of multiple basing point delivered price systems will result in decentralization of industry the spokesmen of industry claim the reverse and say that a system of flat f. o. b. steel prices for example will cause consuming plants eventually to be concentrated in back yards of steel mills which would mean a chain of local monopolies in the course of time.

Simon Hits FTC—While Capehart specifically said that the committee is simply raising questions and has no preconceived answers at this time, William Simon, the committee's general counsel, in his summation of antitrust law administration and interpretation to date voiced conclusions which seem to promise trouble for the Federal Trade Commission. After a lengthy analysis of FTC orders and court decisions Simon concluded: "No basing point system, uniform delivered price, uniform zone price or systematic freight absorption to meet competitors' lower prices is valid if the commission chooses to say it is not." He added: "The commission has established no rules defining what pricing policies will be considered unfair methods of competition. It does not propose to do so. It is therefore, not possible to define the limits of illegal pricing practices under the Federal Trade Commission Act."



LEAPFROGGING: Only 6 minutes of actual moving time were required to hoist a 20-ton crane over another crane resting on a track 43 feet above the ground at the plant of Eaton Mfg. Co., Foundry Division, Vassar, Mich. A pair of 80-foot boom mobile hoists lifted one crane 17 feet above the track while the other was moved under it

Where Does Steel Go?

Martin committee starts sweeping investigation of industry's distribution practices

QUESTIONNAIRES asking "where," "how much" and "to whom" steel products are being distributed have been sent to the steel industry by the Senate Small Business Committee's steel subcommittee, headed by Sen. Edward Martin (Rep., Pa).

The study is one of the largest ever undertaken by a congressional committee of the industry's sales and distribution data. If completed, it will provide the first industry-wide picture of geographical distribution of steel products, as well as the amounts producers are supplying to affiliated steel-consuming companies and warehouses.

Whether the 15 large producers, representing 80 per cent of capacity, to whom the questionnaires have been sent will supply the data requested is questionable. Full response would entail a huge tabulation task and would disclose information which the individual companies regard as confidential. The committee, however, has assured the companies that individual returns will be held in strict confidence.

The questionnaire, composed of three forms, covers information on distribution of steel products in 1940 and 1947 as follows: 1. By geographic areas, sheets, strip, bars, pipe and tubing; 2. to affiliated steel consuming companies, sheets, strip, bars, pipe, tubing, shapes and plates; 3. to affiliated warehouses, sheets, strip, bars, pipe, tubing, plates, shapes and wire products.

Steel Wages at Peak

AVERAGE hourly earnings of wage earners in the iron and steel industry were higher than ever before in July, according to the American Iron and Steel Institute. The July average was $1.645, an increase of 7.6 cents over June and 10.6 cents over July 1947.

Employment set a postwar record in July, estimated at 640,700.

Payroll for the entire industry was estimated at $179,846,000 in July.

Sight Peacetime Record

Steel production for year to total 87 million tons, barring unforeseen interruptions

STEEL production totaled more than 57,500,000 tons of ingots and steel for castings in the first eight months of 1948, an output larger for such a period than ever made before in peacetime.

That is approximately 1,645,000 tons more than was produced in the first eight months of 1947. It exceeded the total output of the entire year 1939 or any other year in the 1930s.

The figures indicate that if steelmaking operations over the next four months continue to be maintained at the rate of the past four months, total production for the year will be in the vicinity of 87 million tons, a peacetime record.

The American Iron & Steel Institute's latest production report also shows that output of steel last month was higher than in any previous August in peacetime, and that electric furnace production of steel in August and in the first eight months was larger than ever before in war or peace.

Output of ingots and steel for castings in August was 7,417,599 tons, compared with 7,068,658 tons (revised) in July and 6,991,152 tons in August, 1947. Steelmaking furnaces were operated at an average of 92.9 per cent of capacity in August, compared with 88.7 per cent in July and 90.2 per cent in August, 1947.

The record output of electric furnace steel totaled 425,827 tons in August. The largest previous month was June, 1948, when 417,665 tons were made. The eight months' production of electric furnace steel was 3,167,505 tons, exceeding any other similar period in war or peace and more than 730,000 tons larger than in the first eight months of 1947.

Steel Shipments Up

FINISHED steel shipments in the first seven months of 1948 were more than 1,300,000 tons higher than in the corresponding part of 1947.

Shipments of cold-rolled steel sheets set a monthly record in July at 583,417 net tons, bringing the total for the first seven months of 1948 to 3,868,500 tons, 23 per cent higher than in the first seven months of 1947, according to the American Iron & Steel Institute, New York.

Total shipments, which stood at 37,486,000 tons during the first seven months of 1948, compared with 36,165,000 tons in the identical part of 1947. Cold rolled sheets were 11.1 per cent of total shipments in July. In the seven months period, cold rolled sheets were 10.3 per cent of total shipments, against 8.7 per cent in the first seven months of 1947.

Shipments of pipe and tubes also have increased. In the seven months of 1948 they totaled 3,846,800 tons, against 3,460,900 for the same period of last year, an increase of 11 per cent.

Substantial increases in seven-month shipments also were made in tin plate, steel plate, and semifinished products.

Total shipments of steel products in July were 5,229,880 tons, an increase of 5.1 per cent over July 1947.

Republic To Roll Cast Billets

REPUBLIC Steel Corp.'s Youngstown works soon will begin experimental rolling of steel products from billets produced by the new continuous casting method.

The experiments are expected to attract wide attention as the continuous casting method is hailed as a potentially revolutionary process in steelmaking.

Oval-shaped castings are being accumulated at Republic's Youngstown plant to be rolled into rounds. Some billets produced earlier have been rolled into skelp and then fabricated into boiler tubes.

The billets are produced at the Beaver Falls, Pa., plant of Babcock & Wilcox Co., which collaborated with Republic in developing the continuous casting process.

More Allocations Studied

PROPOSED allocations programs now being considered by the Office of Industry Cooperation aggregate 150,920 tons of finished steel monthly. These cover eight programs whose steel requirements have been estimated approximately. The programs, together with the monthly steel requirements in each case, are as follows:

Bituminous coal mine maintenance 31,000 tons; various types of mining machinery 48,000; oil terminal storage tanks 20,800; liquid petroleum gas containers 25,000; oil storage tanks for homes, farms and commercial heating plants 20,830; steel doors and bucks 2040; steel base board radiation equipment 750; gutters and downspouts 2500.

All the above programs are additional to 10 programs calling for 491,500 tons monthly already approved as reported in STEEL, Sept. 13, p. 71.

Certain other proposed allocations projects have not yet advanced to a stage where requirements estimates are possible. The leading one looming over the horizon is that of Economic Cooperation Administration for aid to Europe; ECA has dispatched a steel man to Paris to make a survey of essential European steel needs. Another involves steel for construction of ships other than tankers; for this the Maritime Com-

Steel Ingot Production Statistics

	Estimated Production—All Companies									
	Open Hearth		Bessemer		Electric		Total		Calculated weekly production	Number of weeks in mo.
	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	
1947										
1st 6 mos.	38,328,096	95.4	2,177,701	85.2	1,832,760	72.8	42,338,557	93.5	1,636,589	25.87
2nd 6 mos.	38,545,697	94.4	2,054,842	79.1	1,954,975	76.4	42,555,514	92.6	1,619,928	26.27
Total	76,873,793	94.9	4,232,543	82.1	3,787,735	74.6	84,894,071	93.0	1,628,195	52.14
1948										
Jan.	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
Feb.	6,245,338	94.3	340,596	82.3	354,270	82.9	6,940,204	93.0	1,676,378	4.14
Mar.	6,841,578	96.6	363,235	82.0	403,322	88.2	7,608,135	95.3	1,717,412	4.43
1st qtr.	19,855,413	95.5	1,047,000	80.6	1,118,702	83.4	22,021,115	94.0	1,693,932	13.00
Apr.	5,640,168	82.2	185,089	43.2	392,900	88.7	6,218,157	80.4	1,449,454	4.29
*May	6,799,289	96.0	355,562	80.3	416,801	91.1	7,571,652	94.8	1,709,177	4.43
*June	6,481,879	94.5	356,810	83.2	417,665	94.3	7,256,354	93.8	1,691,458	4.29
2nd qtr.	18,921,336	90.9	897,461	69.0	1,227,366	91.4	21,046,163	89.7	1,617,691	13.01
1st 6 mos.	38,776,749	93.2	1,944,461	74.8	2,346,068	87.4	43,067,278	91.9	1,655,797	26.01
*July	6,348,057	89.8	324,991	73.6	395,610	86.7	7,068,658	88.7	1,599,244	4.42
†Aug.	6,620,567	93.4	371,205	83.8	425,827	93.1	7,417,599	92.9	1,674,402	4.43

* Revised. † Preliminary figures subject to revision.

For 1947, percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of Jan. 1, 1947, as follows: Open hearth 81,010,990 net tons, bessemer 5,154,000 net tons, electric 5,076,240 net tons, total 91,241,230 net tons.

For 1948, percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of Jan. 1, 1948, as follows: Open hearth 83,610,690 net tons, bessemer 5,226,000 net tons, electric 5,396,770 net tons, total 94,233,460 net tons.

mission will be the claimant agency. Several involve small tonnages of steel for municipal improvements, notably water pipelines for San Francisco and a bridge across the Nueces river to connect Texas City, Tex., and its airport.

Politics Hits ERP

Europeans press available ECA funds toward immediate relief, neglecting long-term recovery

LOCAL politicians in European countries are playing politics with ECA funds and are delaying the effectiveness of the entire European recovery program.

This was the charge made by Alexander G. Bryant, president of the National Machine Tool Builders' Association, on his return from an extended tour of Europe during which he studied operation of the European recovery program with particular reference to American-built machine tools. Mr. Bryant also is president of the Bryant Machinery & Engineering Co. and vice president of the Cleereman Machine Tool Co., both of Chicago.

Need Machine Tools — "Europe's basic recovery requirement," Bryant said, "is for productive equipment such as machine tools, which will enable Europe to supply its own needs and in addition offer goods for interchange in a free competitive market.

"Most of the countries under ERP, however, have no dollars with which to buy the productive equipment they need. They can buy such equipment only by American money granted them through ECA; and approval for such purposes comes not from the U. S., but from local national authorities, in each country, set up for this purpose."

Want Relief First — "Subject to the pressures with which politicians are always confronted, it is inevitable that foreign government units should lend an ear to immediate relief requirements, rather than those bearing on long-term recovery. The tendency, therefore, is to press available ECA dollars toward relief; thereby forcing industry to buy machinery, even though inefficient for the purposes intended, from any source that doesn't require American dollars.

"The result has been thus far that a manufacturer, in a European country, who wants exactly the right machine tool to do the job in the best possible way, and who knows that an American-built machine tool is the only answer, finds himself in trouble because he can't buy that machine unless the ECA authority in his own country approves it."

To Check on Steel Needs

TO HELP determine quantities and kinds of steel products needed in the European Reconstruction Program, Kenneth E. E. Brown will go to Paris to make a survey for the Economic Cooperation Administration. He is the Washington representative of Bethlehem Steel Export Corp., New York.

AISC To Hear Sykes, Austin

FEATURED speakers at the 26th annual convention of the American Institute of Steel Construction at the Chateau Frontenac, Quebec, Oct. 4-7, will include Wilfred Sykes, president, Inland Steel Co., Chicago; David Austin, vice president, United States Steel Corp., Pittsburgh, and Robert E. Eadie, chief engineer, Dominion Steel Co., Montreal.

Advance registration has passed the 600-mark, assuring an all-time record. More than 100 guests of the Canadian Institute of Steel Construction will be present.

T. R. Mullen, president of the Institute, will present his address on the morning of the opening day, Monday, Oct. 4, while G. E. Treloar, president, Canadian Institute of Steel Construction, and Maurice L. Duplessis, Prime Minister, Province of Quebec, will speak on the second day.

Mr. Eadie will discuss "Canadian Trends in Structural Steel Design." Mr. Sykes will be the principal banquet speaker, with an address entitled "Another Look." Mr. Austin will speak on "Steel is the Structure of Peace."

Control Systems Featured

REFLECTING the ever-increasing adoption and complexity of industrial process controls, regulatory instruments were a center of attention last week at the national conference and exhibit in Philadelphia of the Instrument Society of America.

Industrial instrumentation once consisted substantially of recording devices with limited regulatory control features. C. H. Barnard, applications engineer, Bailey Meter Co., Cleveland, predicted that as the trend toward more complete automatic operation progresses, all sections of a plant will be co-ordinated with a common control system with all separate processes within a given area correlated.

Hundreds of regulator control and measurement recording instruments were displayed in 200 booths by 150 exhibitors. Registration at the conference exceeded 2000.

Calendar of Meetings . . .

Sept. 23, American Iron & Steel Institute: Regional technical meeting, Hotel William Penn, Pittsburgh.

Sept. 23-24, American Management Association: Meeting on productivity, manpower and wages. Association headquarters are at 330 W. 42nd St., New York.

Sept. 27-Oct. 2, Society of the Plastics Industry: Third national plastics exposition, Grand Central Palace, New York. Society headquarters are at 295 Madison Ave., New York.

Sept. 28-30, Porcelain Enamel Institute: Institute is one of sponsors of first international congress on porcelain enameling, London. Institute headquarters are at 1010 Vermont Ave., N. W., Washington.

Sept. 28-30, Association of American Railroads: Convention, Antlers Hotel, Colorado Springs, Colo.

Sept. 28-Oct. 1, Association of Iron & Steel Engineers: Annual convention and exhibition, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland.

Oct. 1-2, Southern Ohio Section of Open Hearth Committee, Iron & Steel Division and Ohio Valley Section, AIME: Annual fall meeting, Deshler-Wallick Hotel, Columbus, O.

Oct. 4-7, American Institute of Steel Construction Inc.: Twenty-sixth annual convention, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 101 Park Ave., New York.

Oct. 4-7, Industrial Packaging Engineers Association and University of Illinois: First annual industrial packaging and materials handling short course, Sherman Hotel, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 5-7, Industrial Packaging Engineers Association: Show at Hotel Sherman, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 5-7, American Institute of Electrical Engineers: Middle eastern district meeting, Washington. Institute headquarters are at 33 W. 39th St., New York.

Oct. 5-9, Concrete Reinforcing Steel Institute: Twenty-fourth semi-annual meeting, Grove Park Inn, Asheville, N. C. Institute headquarters are at 38 S. Dearborn St., Chicago.

Oct. 5-7, Materials Handling Institute: Regional materials handling exposition, Mechanics Hall, Boston. Institute secretary-treasurer is R. Kennedy Hanson, 1108 Clark Bldg., Pittsburgh.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Hotel Stevens, Chicago.

Oct. 6-9, Society of Automotive Engineers: Aeronautic meeting and aircraft engineering display, Biltmore Hotel, Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Oct. 7-8, Society for Advancement of Management: Fall training conference at Illinois Institute of Technology, Chicago. Society headquarters are at 20 N. Wacker Dr., Chicago.

Oct. 11-13, American Society of Tool Engineers: Semi-annual convention, Biltmore Hotel, Los Angeles. Society executive secretary is Harry E. Conrad, 1666 Penobscot Bldg., Detroit.

Oct. 11-13, National Lubricating Grease Institute: 16th annual convention, Edgewater Beach Hotel, Chicago. Institute headquarters are at 4638 Mill Creek Parkway, Kansas City, Mo.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Increasing number of industry men form nucleus of organization that will direct industry in event of war. Former head of Sperry Gyroscope Co. becomes No. 2 top man

MORE familiar faces from industry are encountered each week in the quarters of the National Security Resources Board in the Old State building where a nucleus organization to direct industry in case of another war is being set up rapidly.

New men include: H. L. Tigges, Baker Bros. Inc., Toledo, O., who has been added to the machine tool staff; Edward R. Ehlbeck, gage expert in World War II, who is undertaking a survey of gage needs and the capacity of the gage manufacturing industry; Frank Crockard, formerly vice president, Tennessee Coal, Iron & Railroad Co., who has been named deputy director of the NSRB Steel Division, and Joseph F. Borda Jr., of Bethlehem Steel Co.'s purchasing department, Bethlehem, Pa., who, as in World War II, is to make essential studies of steel capacity in relation to needs; Robert Sebastian, a career government man who has been assigned to nonferrous metals; and Gayle W. Arnold, industrial development manager of the Baltimore & Ohio Railroad, who succeeds Fred E. Henderson as director of the Plant Dispersion Division.

Mr. Henderson, on loan from Western Electric Co., has been moved to the second slot in the Office of War Production, having been named deputy director under Director George E. Felton.

No. 2 top man, right under Chairman Arthur M. Hill, also has been recruited from the ranks of industry. He is Reginald E. Gillmor, from 1932 to 1945 president of Sperry Gyroscope Co. Mr. Gillmor, who recently returned from Greece where he was director of the industry division of the American mission to aid that country, will supervise the work of the NSRB's Mobilization Planning Staff which includes the Offices of Production, Transportation and Storage, Human Resources and Economic Management. In other words he has charge of activities which in World War II were handled by the War Production Board, Office of Defense Transportation, Office of Price Administration, and War Manpower Commission.

(For further details of the organization being set up by the National Security Resources Board to direct industry in the event of another war, see STEEL of Aug. 16, pp. 61 and 62.)

To Re-study Reparations

FIVE United States industrialists have been selected to help determine which of Western Germany's industrial plants now scheduled for removal as reparations would, if retained in production at their present sites, be of importance in the European Recovery Program.

Chairman of the group is George M. Humphrey, president, M. A. Hanna Co., Cleveland. Serving with him are: John L. McCaffrey, president, International Harvester Co., Chicago; Gwilym A. Price, president, Westinghouse Electric & Mfg. Co., Pittsburgh; Frederick V. Geier, president, Cincinnati Milling Machine Co., Cincinnati; and Charles E. Wilson, General Motors Corp., Detroit.

The group will assist Paul G. Hoffman, Economic Cooperation Administrator, in making the study. Under the Economic Cooperation Act of 1948 Mr. Hoffman is directed to request the Secretary of State to obtain the agreement of those countries concerned that such capital equipment as is scheduled for removal as reparations from the three western zones of Germany be retained there if such retention will most effectively serve the purposes of the European Recovery Program.

Speeds Plane Production

WHEN an aircraft manufacturer hereafter develops an improved plane, or when a parts or accessory manufacturer gets out a new or improved gadget, he will be able to get it into production and on the market much faster than heretofore. This is because of a new policy whereby the Civil Aeronautics Administration gives a type certificate immediately on ruling that the new plane or device is safe and satisfactory.

The CAA has authorized the aviation safety agents in its nine regions throughout the country to issue type certificates as soon as the experts in the particular region have reached their decision. Heretofore, the manufacturers had to come to Washington, and they were given an airworthiness certificate and allowed to operate under a "tentative approval" pending final issuance of the type certificate. Under the old arrangement, manufacturers often were on the hot seat for months whereas now they can get almost immediate clearance and proceed to the production and selling of their new and improved products.

Iron & Steel Branch Set Up

IN VIEW of the perplexing questions which often have to be wrestled with in considering requests for steel under the European Recovery Plan, the Economic Cooperation Administration has established an Iron & Steel Branch in its Industry Division.

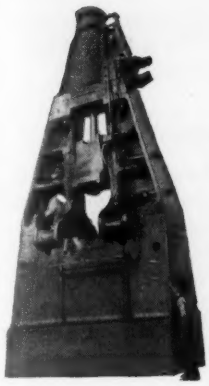
Chief of the Iron and Steel Branch is Langdon S. Simons, who can be seen in ECA's quarters at 800 Connecticut avenue, opposite Lafayette Square. In 1942-43 Mr. Simons was executive assistant to the chief of the War Production Board's Steel Division, and later served with the export steel branch. In 1944-45 he was program director for the China-American Council of Commerce and Industry. Mr. Simons was secretary-treasurer of the Steel Export Association of America from 1939 to 1942. He has been secretary-treasurer of the Optical Manufacturers Association since 1946.

Trade Group Men Angered

RESENTMENT of trade association executives over the policy barring them from meetings of the Office of Industry Cooperation with its industry advisory committees was expressed in no uncertain style when a number of these men met in closed meeting with Earl Clark, acting director of the OIC late on Sept. 9. Earlier in the day Mr. Clark, Commerce Secretary Charles Sawyer and a number of other government notables had asked an invited group of several hundred trade association executives, at a public meeting, to get their industries to participate in a scrap drive to start Dec. 9.

The trade association men told Mr. Clark they did not seek membership in the industry advisory committees; rather, they wanted to attend the meetings with these committees so

CHAMBERSBURG HAMMERS



Steam Drop Hammer

For over 50 years Chambersburg Engineering Company has specialized in building Forging Equipment. The high reputation which this company enjoys is an acknowledgment of the service built into its products.

Steam Drop Hammers

The model "E" Steam Drop Hammer embodies many exclusive Chambersburg features, such as differential cylinder porting, frame-to-anvil construction and many other features that result in more forging per blow, more blows per minute and accurate, close-limit forgings.

Board Drop Hammers

Made in belt drive or motor drive models. Modern design results in more accurate close-limit forgings, less downtime and lower maintenance cost.

Board Drop Hammer

Ceco-Drops

The new Ceco-Drop will out-produce any existing gravity drop hammer. Operates on steam or air. No boards, no motors. Performance records show *at least* 10% more forgings than on conventional gravity drop hammers, with simplicity, safety and low maintenance as additional features.

Self-Contained Pneumatic Forging Hammers

Has a greater forging output than any other hammer of its type. Has heavier anvil, higher impact speeds, delivers more powerful blows and permits greater ease in control of blows. Can be installed anywhere regardless of steam or air supply. Operates from electric current with built-in air compressor.

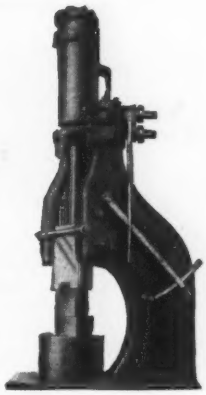
Ceco-Drop

Steel Side Trimming Presses

Sturdy construction, due to patented Forged Steel Side Frames, makes these presses ideal for trimming, blanking, punching, bending and shaping operations. Continuous operation, low power consumption and minimum floor space. Easily accessible from front or back.

Single Frame Forging Hammers

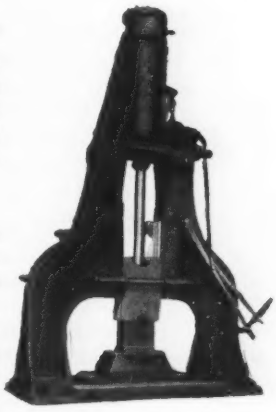
High Frame provides greater working space than any other single frame hammer. Can forge large dics, and rings, upset high stems, form arch bars, etc., most economically.



Single High Frame Guided Ram Forging Hammer

Double Frame Forging Hammers

For the most exacting forging requirements. Greater forging capacity per blow, more work at higher temperatures, savings in power and operating costs. Provides positive, easy control.



Double Frame Guided Ram Forging Hammer

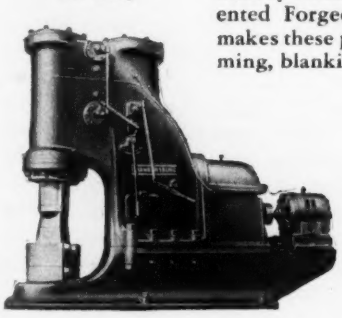
Cecostamps

A high production, impact-type stamping machine for drop stamping lightweight, high strength, hard-to-form alloy sheet metal parts. Uses inexpensive, easily made dies of lead, zinc, Kirksite or similar metals. No matter how springy or resilient the sheet may be, a single blow from the Cecostamp results in a permanent set. Installed in many of the country's important sheet metal shops as well as in most of the aircraft manufacturing plants in the world.

Railway Car Wheel and Driving Wheel Presses

Chambersburg Hydro-Pneumatic Wheel Presses embody the highest degree of speeed, efficiency and economy, and represent the best investment for their type. For mounting and demounting in shortest space of time.

Cecostamp

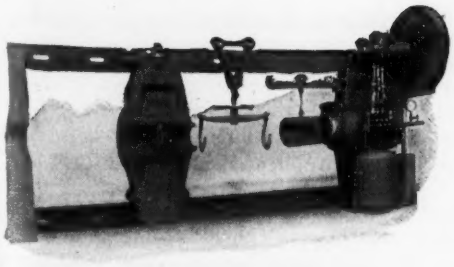


Pneumatic Hammer

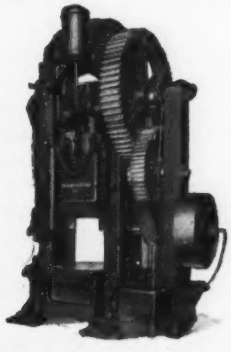
Send for Complete Bulletins

CHAMBERSBURG ENGINEERING CO.

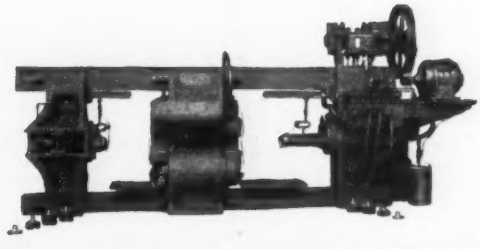
CHAMBERSBURG PENNSYLVANIA, U. S. A.



Vertical Driving Wheel Press



Steel Side Trimming Press



High Speed Duplex Mounting and Demounting Car Wheel Press

RIGID-FRAME DISK: Two old farming problems—transporting disk harrows and controlling depth of the disks in the field—have been solved by the application of hydraulic power in a new model introduced by Dearborn Motors Corp., Ford Motor affiliate. The new lift-type, rigid-frame tandem disk harrow is pictured above. Flexibility of gangs is eliminated and gangs are set permanently at a working angle of 20 degrees. Depth of penetration is regulated hydraulically. Because the implement is attached to the tractor, all that is necessary to transport it is raise it hydraulically and drive away

as to be able to advise their industries about the matters discussed in arranging voluntary allocations programs. They pointed out that only those companies participating in the committee meetings know what really is going on, which makes for discrimination against all the companies not having membership on the committees.

It seems that the conference at which Secretary Sawyer and John Virden were to listen to the arguments of the trade association executives has been abandoned due to the resignation of Mr. Virden as OIC director. However, the Commerce Department has not heard the last of this matter and will not be permitted to ignore it much longer, for the trade association executives now are getting really wrought up. The whole matter is to be aired at a luncheon Sept. 23 of the New York Trade Association Executives, and at a panel in Chicago Oct. 3 in connection with the annual convention of the American Trade Association Executives. It is virtually certain that sometime after these meetings, Commerce will be visited by a delegation of trade association men with blood in their eyes.

Large Market Available

ELECTRICAL appliance and equipment manufacturers should not miss the news releases of the Rural Electrification Administration, now moved back from St. Louis and again quartered in the South Agriculture Building in Washington. These news releases list locations of new electrical distribution lines and give manufacturers a good means of checking to make sure their goods are stocked in stores patronized by farmers newly served by electricity.

This is big business. Bob Ingram, REA information chief, says that while no exact figures can be cited, a good estimate is that the average farmer, upon getting an electrical connection, spends $4.50 for electrical appliances and equipment for every dollar of investment in the electrical generating and distributing system. What this means in business opportunities is suggested by the loans to co-operatives during the fiscal year ended June 30; these came to $313 million. If the $4.50 estimate is not out of the way—and it probably is approximately accurate—that means the new lines made possible by loans in fiscal 1948 have created a potential market of $1¼ billion for electrical appliances and equipment.

Where are these new electrical lines? They are in widely separated sections of the country. Loans approved during the week of Aug. 30, for example, include rural lines serving 209 farmers near Allison, Iowa, 462 near Rosebud, Tex., etc.

The Bureau of Agricultural Economics, Agriculture Department, incidentally, has launched a survey to determine uses to which farmers put electricity. This is to be completed next year and will be a helpful marketing guide to manufacturers.

Promotes Exchange of Data

EXCHANGE of research and development information among departments of the National Military Establishment will be promoted by a newly formed Special Committee on Technical Information. Head of this new committee is Dr. Detlev W. Bronk, new president of Johns Hopkins University, Baltimore.

The committee will study the problem of collecting, correlating, reproducing and disseminating technical information potentially useful in the research and development program of the National Military Establishment.

Boost in Canal Tolls Deferred

INCREASE of transit tolls at the Panama Canal has been deferred by President Truman until at least Apr. 1, 1949.

On Mar. 26, the President signed a proclamation which would have raised transit tolls from 90c to $1 a ton. Then the National Federation of American Shipping petitioned the President to postpone the effective date of such action until Congress can study Canal Zone finances. American ship owners transiting the canal are asking that national defense bear at least the interest charges on government funds provided for the building and maintenance of the canal.

Airport Program Progresses

THE FEDERAL-AID airport program continues to roll along steadily. Fifty grants for as many airport projects in the month ended Aug. 15 came to $5,974,198. Including local matching funds, that meant nearly $12 million was set up that month for purchase and improvement of land, building of connecting roads, and purchase of airport equipment. Since May 27, 1947, when the program got under way, the Civil Aeronautics Administration has granted $45,263,009 for 439 projects.

Import Applications Accepted

APPLICATIONS for permission to import tin-bearing alloys into the United States during the fourth quarter of 1948 must be on file by Sept. 30. Applications on form ODC 1041 should be addressed to the Tin & Antimony Section, Nonferrous Metals & Minerals Division, Office of Domestic Commerce, Room 1431, Tempo T Building, Washington 25.

Unveil Machine Tools

First British machine tool exhibition since 1934 attracts much attention

LONDON, ENG.

FIRST machine tool exhibition to be held in Great Britain since 1934 was staged at Olympia Exhibition Hall, London, from Aug. 26, to Sept. 11, and showed products of more than 230 firms. One-fourth of the 200,000 square feet of the exhibit were allotted to products manufactured outside of England with the United States, Switzerland and Belgium being the principal foreign exhibitors. More than 100 American machine tool builders attended the exhibition.

About 4000 tons of complex machinery, worth $12 million, were assembled at the exhibition hall in 18 days. Almost all of the British machines exhibited were of postwar design or new developments and improvements of prewar design.

Among machines built by British manufacturers and shown at the exhibition were: A new type automatic contouring device which works on a profile template system and which is accurate to 0.0005-in., a jig boring machine accurate to 0.0003-in., a hobbing machine with a capacity up to 15 in. diameter and a 6⅜-in. center cutting lathe, having a bed 6 or 7 feet long and capable of sliding feeds of 20 to 600 cuts per inch and surfacing feeds of 30 to 960 cuts per inch.

George Strauss, British Minister of Supply, in opening the exhibition stated that it is almost certain the British output of new metalworking machine tools alone will exceed $120 million during 1948. The British machine tool industry is aiming at an export target of $81.6 million per year, 60 per cent of its total production.

U. S. BUILDS ROADS FOR GREECE: One thousand miles of repaired roads make up a $5 million item in the first year of the American aid to Greece program. Project required substantial quantities of United States road machinery. NEA photo

French Exports Up

PARIS

EXPORTS of iron and steel products, which have been negligible since the war, are beginning to revive. In the second quarter of 1948 France exported 178,000 metric tons. This figure includes the Saar district which is now part of the French customs territory. About half of these exports went to the French colonies. Exports of semifinished steel to Great Britain also have been revived and are on an ascending scale.

Reconstruction and modernization work is proceeding in iron and steel works. Those concerns that have published their annual reports for 1947 show substantial increases in production and are increasing their capacity. The Acieries de Paris Outreau, which specializes in making ferromanganese, spiegel and hematite, have had two blast furnaces in operation since early last year and their output of steel castings is back to prewar level.

It is reported that Neuenkirchen Iron Works are soon to be started up again and that operations will begin with blowing in two out of six blast furnaces.

British Steel Prices Rise

BIRMINGHAM, ENG.

EXTRA fuel costs have been passed on to the consumers with small increases in the cost of British iron and steel. In view of the world shortage of steel, however, it is unlikely that demand will be influenced, although the price rise represents another inflationary step. There are indications, not only in the steel industry but in other business circles in Britain, that purchasing power is not as great as it was a few months ago and it may be that the peak has been reached as far as sales are concerned.

Exports for July were slightly below those of the same month last year, but the tendency is upward for the year to date with total exports of iron and steel at 1,131,884 tons compared with 1,117,241 in the same period of 1947. Of the July total of 194,405 tons, the two largest exports were 16,565 tons to the Union of South Africa and 16,539 tons to Argentina.

Imports of iron and steel in July totaled 46,599 tons as against 42,373 tons in July, 1947. In the period January to July, 1948, imports totaled 265,966 tons as compared with 331,255 tons in the same period in 1947.

A sharp increase in imports should be noticeable between now and the end of the year as negotiations have been concluded for the purchase of 100,000 tons of semifinished steel from Belgium. This should greatly benefit the re-rollers whose existence depends largely on imported steel. Many firms in the Midland area are working below capacity because of the shortage of small billets and sheet bars, despite the fact that order books guarantee 100 per cent activity.

More Steel for Russia

ACCORDING to the Communist party newspaper, *Pravda,* three large new open-hearth furnaces have gone into production recently in the Donets basin. The report stated that a third open hearth is now producing steel at the Makeevka factory and that open hearths had been reconstructed and put back into operation at the Zaporoshe steel mill and the Mariupol factory "Azovstal."

India Buys U.S. Locomotives

PLANS to import 270 locomotives from the United States and Canada during the period from 1949-1951 have been announced by the Indian government. An additional 100 locomotives will be purchased in the United Kingdom and 20 in France. Total cost for the order is estimated in excess of $44 million. A number of technicians will be sent to the United States for training in locomotive construction.

T-H Test Lies in Administration

Both labor and management have received fair deal in first 13 months under new labor relations act. Much interpretation still to come

By SHIRLEY H. SCHEIBLA

ULTIMATE test of the Taft-Hartley Act will lie in its administration and interpretation by the National Labor Relations Board and the courts. This is the consensus of labor-management relations students after observing the law in operation for 13 months.

In slightly more than a year, the NLRB has just begun to scratch the surface of the act. Some of its most important decisions are yet to come. The majority of them will not find general acceptance until reviewed by the Supreme Court. The big questions have been posed, however, and have either reached the NLRB or are on their way.

The decisions, by the board and the courts, will to large extent determine the effect and the effectiveness of the act. There is much leeway. An antilabor administration of the law could severely restrict organized labor; a prolabor administration could nullify much of what Congress hoped to accomplish by enacting it.

Fair To Date—Most students of the act believe the administration during the first 13 months has been fair. Both the board and its general counsel, Robert Denham, have steered a middle course. The result has been that neither labor nor management leaders have been entirely satisfied, which might indicate that the board has not leaned too far in either direction.

Certainly developments so far have not borne out the predictions of union chieftains that the statute would enslave labor and disrupt labor management relations. Organized labor was able to obtain a generous third round of wage increases under the act, and with a minimum of lost time due to strikes.

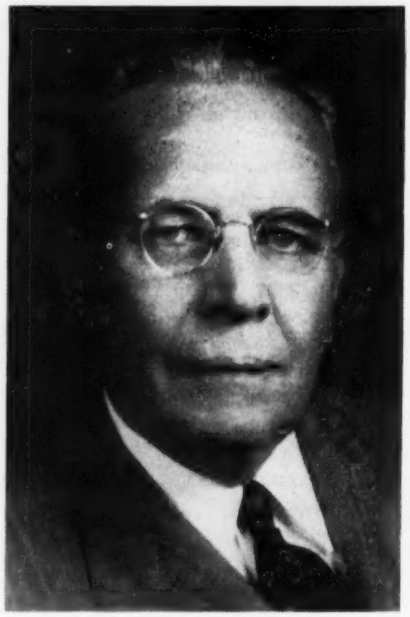
Developments Watched Carefully—Day-by-day developments under the NLRB administration of the law are being carefully watched and weighed by industry, the unions and Congress.

Here are some of the major questions which have been posed so far and the steps taken toward partially answering them (case names or source of statement indicated where appropriate):

Collective Bargaining: Questions: 1. The law requires unions and bosses to "bargain in good faith." What does this phrase mean?

2. What are appropriate subjects for collective bargaining?

3. The board is allowed to certify a union as a bargaining representative of workers for one year. What happens when the unions signs a contract for more than one year?



ROBERT DENHAM

4. Is an employer required to bargain with a union on an extension of a contract for the next year when the board has agreed to hold an election to de-certify the union close to the date when the labor organization wants a new agreement to go into effect?

5. How may an election be obtained to unseat a labor union from the position of bargaining representative for a majority of the workers?

Answers: 1. The obligation to bargain includes a duty to put any agreement in writing.

2. Employers must not refuse to bargain on plans for pensions and retirement and on group health and accident insurance programs. A company also must not refuse to discuss changes in existing plans. (Pensions, case of Inland Steel Co. Insurance, case of W. W. Cross & Co.)

3. "What the act does not permit is the insistence, as a condition precedent to entering into a collective bargaining agreement, that the other party to the negotiations agree to a provision or take some action which is unlawful or inconsistent with the basic policy of the act." (National Maritime Union case.)

4. An existing contract is a bar to an NLRB election to determine the majority status of a union seeking bargaining rights. (Snow-Neally Co. decision.)

5. A board may not de-certify a union as a representative of the workers until the expiration of the union's contract with the company. (Cone Mills Corp. case.)

A supervisor may not act on behalf of a group of employees in seeking an election to de-certify a union as the workers' representative. (Case of Local 13076, District 50, United Mine Workers.)

No proof of the union's representation is required in granting an employer request for an election to decertify it as the majority representative. (Felton Oil Co. case.)

Unions may bargain away rights given them by law in exchange for other benefits. Employers are free to insist on contracts embodying such agreements so long as they do not use unlawful means to persuade unions to accept them. (Shell Oil Co. case.)

Strikes: Questions: 1. What kinds of strikes are illegal?

2. May unions be required to pay damages resulting from illegal strikes? If so, who shall require them to make the payments?

3. What rules govern the conduct of strikers?

Answers: 1. A strike is illegal if it has an illegal objective. (National Maritime Union case.)

A labor organization must not strike for employer recognition when another union has been certified as the proper bargaining representative by the NLRB or one of its regional directors. (Board announcement.)

2. The assessment of damages resulting from strikes is "appropriately a function of the courts rather than of administrative tribunals. (National Maritime Union decision.)

3. The union is responsible for picket-line violence, even if non-members participate. (Case of United Furniture Workers.)

Strikers may push other workers and use profane language so long as they do not do bodily harm or make threats. (Perry-Norvell Co. case.)

Free Speech: Question: 1. The Taft-Hartley Act says it is not an unfair labor practice for employers or unions to express any views or opinions "if such expression contains no threat of reprisal or force or promise of benefit." What does this mean?

Answers: 1. Employers may advise

Members of the National Labor Relations Board, left to right: Abe G. Murdock, John M. Houston, Chairman Paul M. Herzog, James J. Reynolds Jr., and J. Copeland Gray. Photo by U. S. Department of Labor

against joining a union, providing they do not accompany this advice with threats. They also may require employees to listen to antiunion speeches during their working hours. (Babcock & Wilcox Co. case.)

While workers are on company time, nonworking union agents may talk to them about union activities so long as coercion is not involved. (Trial examiner's report in Sealright Pacific Ltd. case.)

The right to give workers advice on joining or not joining unions includes the right to use inaccurate information. (Pittsburgh Steamship Co. case.)

Bargaining Units: Questions: 1. What constitutes an appropriate unit for collective bargaining?

2. The law says bosses may bargain with separate groups of professional or craft workers. When do workers fall in the professional or craft categories?

3. Since employers are not obligated to bargain with units of supervisors or plant guards, what workers are guards and supervisors?

Answers: 1. Bargaining history in an industry may determine whether a proposed unit of craft workers is an appropriate bargaining group. (Bricklayers Union case.)

2. Workers should be given a choice between a craft and an industrial union only when the craftsmen work independently of the rest of the plant employees and cover an entire craft.

Salaried and hourly-paid workers should not be put in separate bargaining units solely because of the difference in the method of paying them. (Case of Standard Oil Co. of California.)

Salesmen who work outside the plant with little supervision should not bargain in the same unit with truck drivers and mechanics

3. One of the factors to consider in determining a worker's supervisory status is whether he has authority to assign work and recommend promotions or demotions for other employees. (Wasatch Oil Refining Co. case.)

Hiring and firing authority makes ship stewards supervisors. (Kinsman Transit Co. case.)

Closed Shops: Questions: 1. What are the penalties for signing closed shop contracts, which are outlawed by the act, permitting employers to hire only union members?

2. If a contract contains a closed shop provision, is the entire contract or only the closed shop clause invalid?

3. Is hiring through union halls a form of the closed shop?

Answers: 1. If an employee is discharged because of a closed shop agreement both the union and the employer may have to pay the worker for wages lost as a result of the discharge. (Denham statement.)

2. A closed shop clause should not invalidate an entire contract. (Informal opinions expressed by NLRB officials.) If closed shop provisions are deleted from contracts unions already have signed, however, they may find themselves bound by an agreement which has no provision for union preference in hiring.

3. Unions must not force companies to discriminate against nonunion members. (National Maritime Union decision.)

Union Shop: Questions: 1. The law says a union may seek a contract making union membership a condition of continued employment only when a majority of the workers vote to confer such negotiating power on the union in an NLRB election. Once the workers have voted in favor of a union shop, is an employer obligated to give them one?

2. What are the penalties, if any, for carrying out a union shop agreement without an NLRB election?

3. Once a union obtains NLRB sanction to sign a union shop agreement, how long does it retain it?

Answers: 1. When a union wins a union shop election it has only the authority to ask for a union shop contract. An election victory does not compel the employer to sign an agreement. (Denham statement.)

2. It could be illegal interference for a company to carry out a union-shop contract without a board ballot beforehand. The employer could be required to reinstate workers fired under the contract and to pay them the wages they lost while out of work. (Denham statement.)

3. The authority to negotiate a union shop agreement is good until revoked by an election requested by 30 per cent or more of the employees or until the union is displaced as a bargaining agent. (Denham statement.)

Communist Affidavits: In its only Taft-Hartley Act decision so far, the U. S. Supreme Court ruled it is constitutional to require union officers to sign non-communist affidavits before using NLRB facilities. Virtually all the other big questions on this subject have been answered at one level or another. Here are the answers:

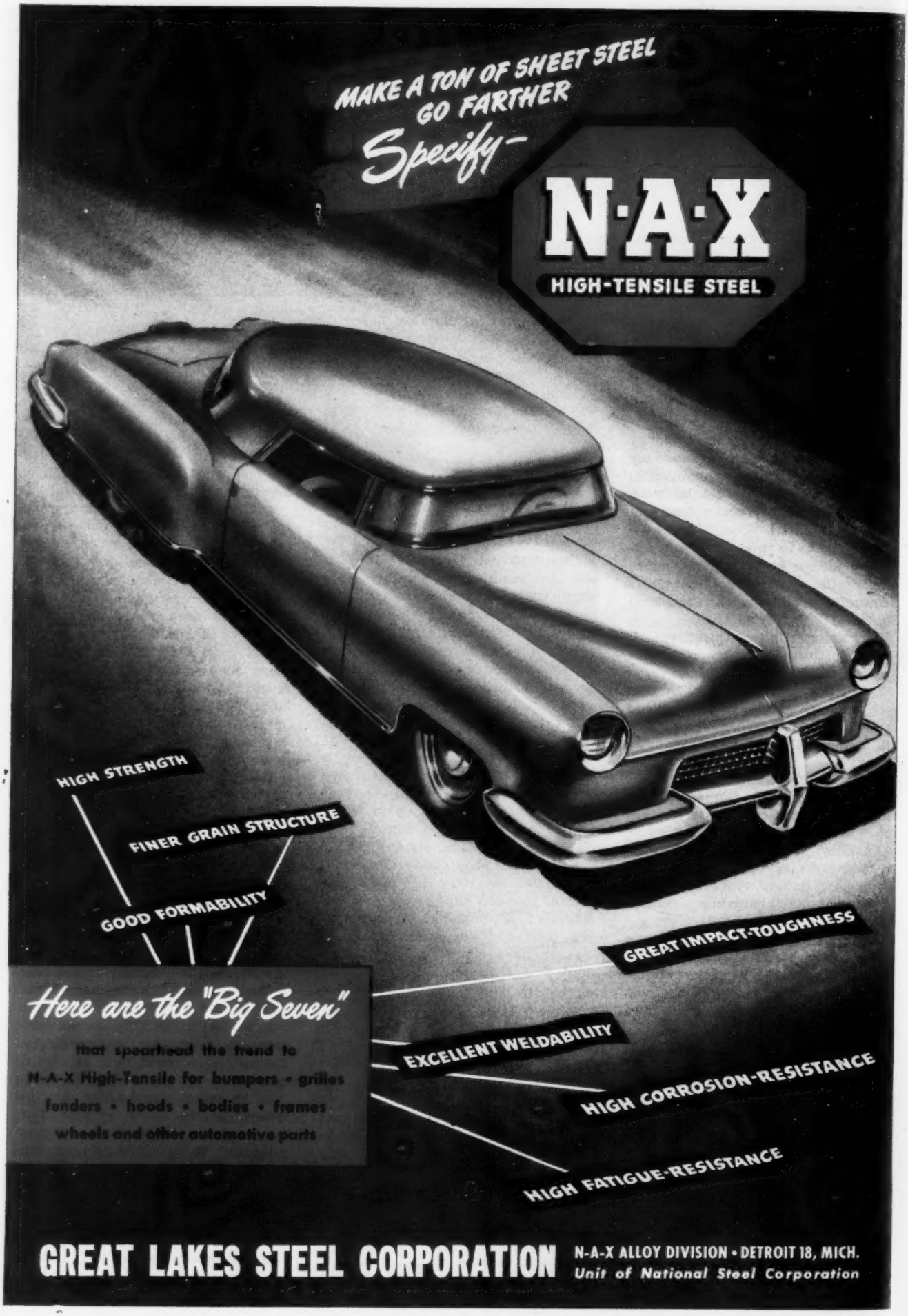
1. It is not up to the NLRB to investigate the accuracy of non-communist affidavits. (Denham statement.)

2. The AFL and CIO are not labor organizations within the meaning of the act. As a result their officers do not have to sign the affidavits.

3. An international union may not "front" at the board for any of its locals whose officers have not complied with the affidavit requirements. (Lane Wells case and U. S. Gypsum case.)

4. Non-complying unions may be called before the board when charges have been filed against them.

5. The board will not put members of complying and non-complying union locals in one bargaining unit.


MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N-A-X
HIGH-TENSILE STEEL
HIGH STRENGTH
FINER GRAIN STRUCTURE
GOOD FORMABILITY
GREAT IMPACT-TOUGHNESS
EXCELLENT WELDABILITY
HIGH CORROSION-RESISTANCE
HIGH FATIGUE-RESISTANCE
Here are the "Big Seven"
that spearhead the trend to
N-A-X High-Tensile for bumpers • grilles
fenders • hoods • bodies • frames
wheels and other automotive parts
GREAT LAKES STEEL CORPORATION
N-A-X ALLOY DIVISION • DETROIT 18, MICH.
Unit of National Steel Corporation

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

General Motors realigns top executives. H. H. Curtice leaves Buick to become executive vice president in charge of all general staff activities

DETROIT

LONG-RUMORED realignment of top executive ranks of General Motors Corp. was given the blessing of the corporation's directors in New York last Monday and announcements were made immediately instead of being deferred until the Quebec executives' conference this week, probably for the reason that leaks here and there would have had most of the news out unofficially by now anyway.

Heading the list is the transfer of H. H. "Red" Curtice from his post as GM vice president and general manager of the Buick Division at Flint to executive vice president in charge of all general staff activities of the corporation. These include distribution, styling, engineering, research, personnel, employee relations, public relations, business research, procurement and schedules, facilities and processes, real estate and the Motors Holding Division. That is quite an assortment of responsibilities and unquestionably places the genial Mr. Curtice right in line to become the next president of GM.

There are two other executive vice presidents: M. E. Coyle who is now in charge of the car and truck group, body and assembly divisions group and the accessory group, and O. E. Hunt who heads up all other operating divisions including the engine group, the Dayton and household appliance group and the overseas and Canadian group. To many outsiders the identifications of these various activities doubtless sound like meaningless mumbo-jumbo, they boil down to a 1-2-3 executive lineup under President C. E. Wilson of Curtice, Coyle and Hunt.

Started As Accountant—Curtice is 55, started with AC Spark Plug in 1914 as an accountant, had a meteoric rise in the next 20 years and took over the reins at Buick in 1933. At that time Buick was sort of rattling around in a vacuum, not knowing just which way to go. Under Curtice, an organizational teamwork and esprit de corps were built up which continue to be distinctive in the industry. Production rose from 43,000 in 1933 to 377,000 in 1941, despite some major engineering errors which might have wrecked another company. Plant capacity now has been built up to handle 500,000 cars annually if materials are available. Departure of Curtice from Flint will leave a big hole both in the division and in the community, since his entire 34-year career has been in that city.

His desk at Buick will be taken over Nov. 1 by Ivan L. Wiles who has been with the division since 1932, as comptroller since 1941.

Hufstader Becomes VP — At the same time Buick's sales manager, W. F. Hufstader also will leave for Detroit to become a vice president in charge of the distribution staff, a post held hitherto by W. G. Lewellen who is resigning to enter business for himself. While it is a step up the ladder for Hufstader, he will doubtless greatly miss his former work of sparking the sales force for a "hot" car. In earlier years he was active in sales activities for Dort, Mason, Graham, Dodge and Chrysler, joining Buick in 1929 and becoming sales manager at about the time Curtice took over as general manager. The two men always have been quite close and will continue to be in their new locations.

Last Thursday, L. C. Goad, a GM vice president and general manager of the Fisher Body Division, became executive in charge of the body and assembly divisions group, under Mr. Coyle, a job which has been vacant due to the illness of T. P. Archer. Direction of Fisher Body operations will fall to John J. Cronin, formerly general manufacturing manager. Cronin joined Fisher in 1918 and came up through cost, engineering and production standards departments. For the past three years he has been in charge of manufacturing. Goad's route to the top has been through Delco-Remy and AC Spark Plug Divisions, and during the war he did an exceptional job as head of the Eastern Aircraft Division, largest producer of Naval aircraft. He has been with Fisher only since September, 1946.

Staff Activities Regrouped—Stephen M. Dubrul, who has headed what is called by the imposing name "social and economic relations section of the public relations department" (page the New Deal bureau namers) on Nov. 1 becomes chief of a newly-created and more prosaicly titled bus-

H. H. CURTICE

W. F. HUFSTADER

JOHN J. CRONIN

L. C. GOAD

IVAN L. WILES

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

iness research department, under Mr. Curtice's direction. The former section will be abolished.

Staff activities of GM formerly reporting to W. F. Armstrong, in charge of central manufacturing and real estate and now general manager of Chevrolet (noted in these pages last week), are regrouped as follows:

Rodger J. Emmert, since 1933 factory manager of the truck and coach division of GM in Pontiac, will take over direction of a new facilities and processing staff, focal point for the study of new manufacturing techniques.

Roger M. Kyes, who left the presidency of the Ferguson Tractor organization when the facilities were taken over by Ford and recently joined GM as a special assistant to the president, will pilot a new procurement and schedules staff, which has come to be a highly important activity in these days of tight materials and supplies. Kyes is a comparative youngster in the GM family and appears headed for important future assignments.

Fred G. Tykle, a plant engineer at Allison in Indianapolis from 1940 to 1945 and since then director of real estate in the central offices of GM, continues in that position.

Other Changes Due—In addition to signalizing handsome promotions to a large group of men (numerous other changes will be made by the various divisions to replace men who have left or moved up) this major overhauling of the administrative roster of General Motors marks a long step in the direction of better streamlining and co-ordination of central office responsibilities. The able hand of Chairman Alfred P. Sloan is seen in the checkerboard manipulation of his key executives. Rumors were current that Mr. Sloan might announce his retirement at the directors' meeting, but such did not prove to be the case. The shifts are unique in that there is probably no large corporation in the world sufficiently deep in executive talent at most levels to permit such an extensive regrouping of top personnel at one time.

$75 Billion Worth of Cars

LATEST and twenty-eighth annual edition of the Automobile Manufacturers Association facts and figures is off the press. In addition to benchmarking the production of 100,000,000 vehicles since the turn of the century, the 80-page volume carries all the assorted tabulations of production, registrations, employment, taxes and related figures pertaining to the building, and operation of motor vehicles. Included are new data indicating that there are 50,000,000 motor vehicle drivers or 49 per cent of the population above 16 years of age. Another recent survey shows that 90 per cent of all cities and towns having local passenger transportation systems are served by busses only, and that 2140 towns have no local mass transportation but depend upon private automobiles. In at least a dozen aspects the automotive industry in 1947 operated at new record levels, one being the $3 billion in motor vehicle taxes paid.

The 100,000,000 vehicles built since 1900 are estimated to have represented a wholesale value in excess of $75 billion. Well over half of them have been scrapped, of course, although 42 per cent of the passenger cars in use in 1947 were ten or more years old, in contrast to 17 per cent in 1941.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,336	366,205
February	399,471	393,663
March	519,154	443,588
April	462,323	445,137
May	359,996	404,191
June	454,401	421,466
July	489,736	399,456
August	477,671*	364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.
† Revised by Automobile Manufacturers Association.

Estimates for week ended:

Aug. 28	100,699	88,098
Sept. 4	101,879	83,444
Sept. 11	76,792	106,095
Sept. 18	80,000	109,734

Estimates by Ward's Automotive Reports

An interesting comparison has been drawn in the publication between factory sales of passenger cars by body types in 1940 and 1947. Noteworthy is the rise in the proportion of convertibles and station wagons to the total. Convertibles in 1947 totaled 173,863, against 105,335 in the earlier year, a 65 per cent gain numerically and from 2.8 to 4.9 per cent of the total.

Similarly, station wagons went from 25,098 to 80,079, an increase of 219 per cent, or from 0.7 to 2.3 per cent of the total. The latter is accounted for largely by the popularity of the lower-priced Willys-Overland all-steel station wagon. Two-door sedans and coupes declined from 54.2 to 40.9 per cent of the total, four-door sedans went up from 41.9 to 49 per cent. The trends are graphic illustrations of increases in warborn spending ability of car buyers. Steadily mounting prices could force a complete reversal of the trend in the next few years as convertible owners move back down to two-door sedans. For the present, builders are trying to turn out every station wagon and convertible possible, for one reason because they embody a higher than average profit margin.

Buick Builds 5 Million

BUICK rolled out its 5,000,000th passenger car last week, since the time 45 years ago when David D. Buick assembled his 2-cylinder, 21-horsepower mechanized carriage weighing about 1850 pounds. Sixteen cars were built in 1903, the 1,000,000th 20 years later, the second million by 1927, the third in 1936 and the fourth in 1940. About 2,000,000 still are in operation.

Chevrolet Makes 21 Million

MEANWHILE, Chevrolet has tagged its No. 21,000,000, built since 1912. The Atlanta, Ga., assembly plant champagned its 2,000,000th vehicle built in 21 years almost at the same time.

Institutional Day at Willys

WILLYS-OVERLAND will be host to several hundred at its third annual institutional day in Toledo, O., Oct. 6. A full line of the company's utility vehicles will be on display, with new suggestions as to their uses, and guests also will be shown results of the year's progress in plant modernization and expansion.

Studebaker Ships Components

STUDEBAKER is shipping complete sets of components for assembly of cars and trucks in nine overseas plants in India, South Africa, Brazil, Belgium, Denmark, Sweden, Mexico, Egypt, and Eire. Knocked-down passenger cars are shipped in individual boxes, while partially disassembled trucks are boxed in units of two, five boxes being required to make one shipment of two trucks.

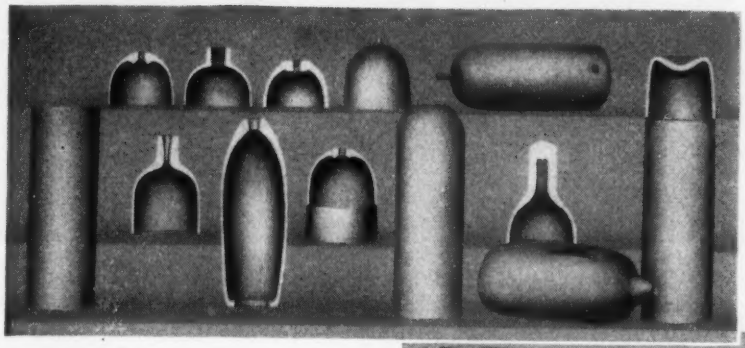
Nash Sponsors Election Coverage

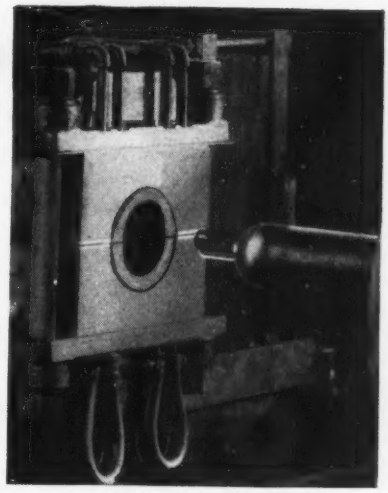
NASH-KELVINATOR will sponsor the CBS coverage of the Nov. 2 election, marking the radio industry's first contract for network sponsorship of presidential election coverage.

Federal

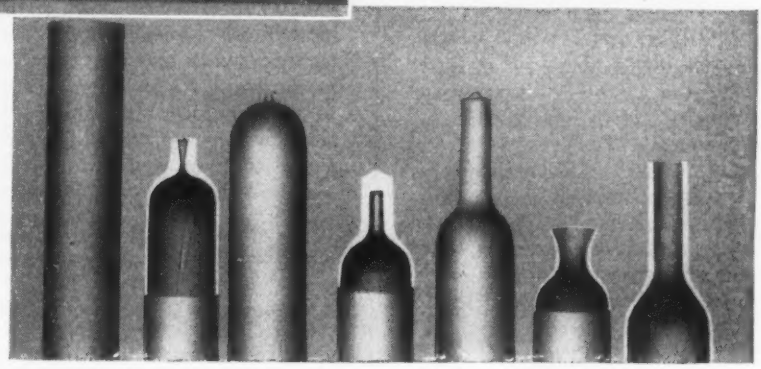
announces

"THE WESTIN PROCESS"





PATENTED



Here's a really new way to form tubular sections. Far more efficient than conventional methods in use today, the revolutionary Westin Process is performed by a combination of electrical current and pressure. Its application means considerable savings in time and material, and a greatly improved product quality. Developed to enable manufacturers to achieve lower unit cost of production, this new process is particularly adaptable to forming steel gas cylinders, upsetting sections of tubing to increase wall thickness, sealing tube ends, necking-down tube sections and performing other high-production operations of a related nature on low carbon, alloy steel, brass and other metals.

The Westin Process is one more example of how Federal is making every effort to reduce costs and increase production and quality in the metal working field.

When forming tubular sections, it will pay to look into the Westin Process. The illustrations on this page are intended only to set you to thinking about your own production. It costs nothing to inquire.

Federal is equipped to handle every type of metal forming or resistance welding application. Let our engineers analyze your product and show you new economies in your press and welding operations.

Federal WELDERS

RESISTANCE WELDERS FOR EVERY APPLICATION
FROM 50-TON OBI TO 2000-TON DOUBLE ACTION

Warco PRESSES

THE FEDERAL MACHINE AND WELDER COMPANY

Dept. 498 Plant 2, Warren, Ohio • • *Offices in Principal Cities*

Diesel Building Booms

Company foresees increasing demand for diesel-electric locomotives

MORE than a billion dollars worth of diesel-electric locomotives will be built at the Schenectady, N. Y., plant of American Locomotive Co. in the next ten years, according to a prediction by Robert B. McColl, president. He believes that it will take approximately 20,000 diesel-electric locomotives in the next ten years to replace the 35,000 units now in operation in the United States.

Alco went out of the steam locomotive business last June, converting 100 per cent to diesel-electric production.

Mr. McColl said that dieselization of all Class I railroads will result in annual savings of more than half a billion dollars just from the cost of fuel and its transportation. Full dieselization of all U. S. railroads would result in less fuel oil being used than is required by locomotives today, Mr. McColl pointed out. Currently a total of 227,485 bbl of fuel oil are consumed daily by U. S. railroads and the estimate of requirements with complete dieselization is 170,343 bbl daily.

In addition, Mr. McColl reported, there is a lively interest among foreign railroads in the economies possible with this type of operation. The company has already shipped postwar diesels to Portugal and Brazil.

DEMONSTRATION MODELS: Something new in automobile assembly lines is this miniature unit where 1/16-scale model Hudson sedans are being assembled at a rate of 60 per hour. Built of molded plastic sections, the models are 13 inches long, one side being finished in color, the other transparent to reveal construction details of the recessed floor and the integral-type frame. There are about ten different molded parts involved, for the production of which stainless steel dies costing around $35,000 were built over a period of four months. The models, which will be made in full color as well as half-transparent versions, will be sold to dealers who will use them for demonstration purposes as well as for gifts and other promotional techniques.

Ideas Worth $1 Million

WITH the payment of $350 to a toolmaker in its Newark, N. J., Meter Division, Westinghouse Electric Corp., Pittsburgh, has passed the million dollar mark in cash paid to employees who have suggested new and better ways to do their jobs. Since the policy was begun in 1910, the company has to date paid out more than $1 million with half of this total paid in the last 5 years. During the half-year period just completed, Westinghouse paid $72,366 to 2859 employees.

Construct Plant for Pesco

IMMEDIATE construction of a $2,650,000 plant on a 35-acre site near Cleveland is planned by Borg-Warner Corp., Chicago. The new plant will house the company's Pesco Products Division which will be moved from its present Cleveland location.

Plant will be a one-story brick and steel structure with 219,000 square feet of space and will be used for the manufacture of high precision aircraft parts after its completion next May. The division's production volume has quadrupled since the end of the war, thereby dictating the need for an efficient new factory. Building will also house a metallurgical laboratory, an electrical laboratory and a research laboratory for testing of hydraulic equipment.

Power Brushing Show Room

MANY phases of metal cleaning, polising and deburring at variable speeds are now being demonstrated at the plant of Osborn Mfg. Co., Cleveland, manufacturer of power driven brushes. A new demonstration room is expected to help solve customers' vari us metal finishing problems and also to educate distributors and salesmen on application possibilities of the company's products.

Numerous pieces of equipment are available in the room making possible demonstrations simulating actual production practices in the customer's plant. Studies by Osborn engineers in recent years indicate that many brushing operations can be improved if proper operating speeds and other factors are considered and use of this room, which will enable demonstrations at speeds different than those available at many plants, is believed the answer to many production problems.

Railroad Modernizes

EXTENSION of Pennsylvania Railroad's postwar expansion program, constituting the largest single project of this type in its history, brings the total being expended to a sum in excess of $216 million. Included in the program are 566 diesel-electric locomotives; 395 lightweight all-room sleeping cars, overnight coaches, dining cars; 273 coaches, parlor and dining cars being modernized, 4400 new freight cars and 8149 others undergoing extensive heavy repairs.

Materials shortages and other factors have slowed down deliveries but an improvement in the current situation means that deliveries of all equipment are expected this spring. So far the railroad has received 68 new diesel locomotives, 156 diesel switchers, 113 lightweight passenger coaches and 2200 new freight cars.

Monongahela Dam Started

CONSTRUCTION which has begun on the new $6,343,650 Morgantown, W. Va., lock and dam will, when completed, throw open the coal fields around Morgantown to shipment of coal by water to Pittsburgh and beyond. Dravo Corp., Pittsburgh, was awarded the contract for construction of the lock and dam by Corps of Engineers, Pittsburgh.

Located about 100 miles above the Point in Pittsburgh, the new navigational dam completes the chain of eight modernized dams on the Monongahela between Morgantown and Pittsburgh. It is being built immediately above the present Dam No. 10, which it will replace. Dam No. 11, further up the river, will also be made obsolete by the new dam. Construction of the dam which will have a lift of 18 feet, highest on the Monongahela, is expected to take approximately 3 years.

Demonstrate Coal Separator

EQUIPMENT to be installed in the $10 million coal preparation plant being built in East Frederickstown, Pa., by F. H. McGraw & Co., New York, for Jones & Laughlin Steel Corp., Pittsburgh, was demonstrated recently in Chicago. The coal cleaning process which will separate metallurgical coal from steam coal utilizes a "sink and float" principle.

Executives of coal and steel companies observing the demonstration at test plant of Nelson L. Davis & Co., designers and builders of the equipment, saw coal put through the process at rate of 250 tons an hour per vessel. By means of this process, great savings are expected to result for coal producers and also for steelmakers since the latter will benefit by reduction in amount of sulphur which eventually gets to the blast furnace.

U.S. Rubber Capacity Up

Postwar plant expansion and modernization running to better than $80 million has raised production capacity of United States Rubber Co. to the highest peak in its history. About $30 million has been spent since the war on tire production facilities and $50 million on other products. The funds went for new buildings, new machinery and research equipment. Around $24 million was earmarked for plants producing hose, belting, friction tape, wire and other special rubber products used by the oil, automobile, electrical, railroad, steel and similar key industries. Added amounts were spent for facilities to produce chemicals, textiles and plastics.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

J. H. Williams & Co., Buffalo, manufacturer of drop-forgings and drop-forged tools, will open a warehouse and sales office at 2266 E. 38th St., Vernon, Calif., Oct. 1. Charles F. Coates has been appointed western district manager.

—o—

James F. Lincoln Arc Welding Foundation, Cleveland, has made a joint award of $5000 to Prof. C. D. Williams of the University of Florida, Gainesville, Fla., and to Prof. E. C. Harris of Fenn College, Cleveland, for their co-authorship of a textbook manuscript in the foundation's textbook award program. Manuscript is entitled "Structural Design in Metals."

—o—

Pratt & Whitney Aircraft Division, East Hartford, Conn., United Aircraft Corp., has named its all propeller-turbine and turbo-jet engines the Turbo-Wasps.

—o—

L & J Press Corp., Elkhart, Ind., has appointed Hoffman-Marquard Iron & Machine Co., St. Louis, as dealer for L & J's open back inclinable punch presses.

—o—

Jas. P. Marsh Corp., Skokie, Ill., manufacturer of precision instruments, will acquire Witt Gauge Division of National Pressure Cooker Co., Sept. 30. The identity of the Witt line of gauges will be preserved, but the devices will be produced in the Marsh plant by the Witt Gauge Division of the Marsh organization.

—o—

Rochester Telephone Corp., Rochester, N. Y., has installed high-speed rotary dial telephones developed by International Telephone & Telegraph Corp., New York.

—o—

American Cladmetals Co., Carnegie, Pa., has enlarged its sales technical, office and plant staffs following increased demand and production of cladmetals.

—o—

Association of American Railroads, Washington, reports that the average load of freight per train in the first six months of 1948 was 1153 tons, highest in history.

—o—

Sylvania Electric Products Inc., New York, is expanding production of television viewing tubes and will begin output of this device soon at a plant under construction at Ottawa, O. This facility will double production of the tube which is also manufactured at two plants at Emporium, Pa.

—o—

Ryan Aeronautical Co., San Diego, Calif., has set a production schedule of four planes a day for its Navion four-place personal plane. This rate is expected to be continued at least through late autumn.

—o—

Peerless Pump Division, Food Machinery Corp., has almost completed alterations at its new plant at Indianapolis which was purchased from War Assets Administration late in 1946 for $861,000.

—o—

Kieley & Mueller Inc., North Bergen, N. J., announces the appointment of Charles W. Snyder Co. Inc., Tulsa, Okla., as agents for their line of automatic and pressure controls in refineries and other industrial plants in the midcontinental area.

—o—

Braun Tool & Instrument Co., Hawthorne, N. J., is now occupying a new building where it has set up a complete plant for producing beryllium copper stampings in addition to its regular field of short run stampings in other nonferrous material.

—o—

Geometric Tool Co., New Haven, Conn., manufacturer of machinery and tools for cutting screw threads, has named Mideke Supply Co., Oklahoma City, Okla., as distributor for the state of Oklahoma.

—o—

Ward Leonard Electric Co., Mount Vernon, N. Y., has recently moved its Rochester, N. Y., branch office to a new location at 66 South St.

—o—

Consolidated Vultee Aircraft Corp., San Diego, Calif., has been awarded an additional contract for 154 L-13 liaison aircraft by the U. S. Air Force. Contract price of the new order is $3,060,288, which includes spare parts and special airborne and ground equipment.

—o—

Baldwin Locomotive Works, Pittsburgh, has completed a streamlined non-condensing steam turbine locomotive for high speed passenger service on Chesapeake & Ohio Railway. The locomotive is powered through a 6000-horsepower steam turbine connected to generators that drive the traction motors.

The Business Trend

LOSS of one day's production on Labor Day markedly lowered STEEL's industrial production index for the week ended Sept. 11 to a preliminary 159 per cent of the 1936-1939 average. The 11-point drop was larger than in the Labor Day week last year but with production on a higher plane this year, the reduced rate of output was substantially above last year's 153 per cent.

STEEL—Steel ingot production did not show any effect of the holiday and continued at a high 95 per cent of capacity for the second consecutive week. Output of the finishing mills, however, was lower because of the one day shutdown.

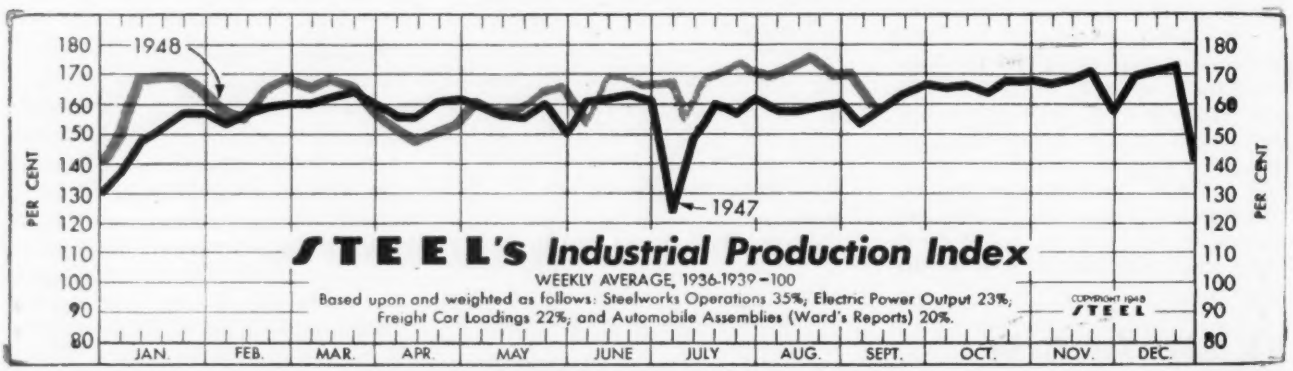
AUTOMOBILES—Not only the holiday but materials shortages resulting from past and current strikes caused automobile production to drop 25,000 units, resulting in an out-turn of 76,792 passenger cars and trucks, the second lowest weekly figure this year. The idling of an estimated 50,000 workers due to a strike at the plant of a prominent Detroit body builder was a big factor in low production figures for the week. Also, model changeovers have slowed production at several independent automobile producing plants with resultant adverse effects on the industry's output.

PETROLEUM—Daily crude oil production in the United States set a new high for the fifth successive week in the seven-day period ended Sept. 4, according to American Petroleum Institute. Daily crude output increased 2600 bbl to 5,531,450 bbl although crude oil runs to refineries declined 176,000 bbl to 5,506,000 bbl daily. Stocks of gasoline eased 611,000 bbl to 94,893,000 bbl but were substantially higher than the 85,627,000 bbl in storage at the same time last year. Heavy fuel oil stocks were boosted to 72,308,000 bbl compared with 57,211,000 bbl in 1947.

COAL—Bituminous coal production for the week ended Sept. 4 dropped below the 12 million net ton level for the first time since the week ended July 10. The latest week's production is estimated at 11,890,000 tons. Even with this decline, production was well above the 10,733,000 net tons for the corresponding week in 1947.

RAILROAD INCOMES—Net railway operating income of Class I railroads during July was $105.3 million, according to Association of American Railroads. Net operating income of these same roads in July, 1947, was $61.2 million. After payment of interest and rentals, net income was about $76.7 million, more than double the $34.8 million reported for the same month last year.

PRICES—Although prices of some metals, primarily lead and zinc, rose slightly during the week ended Sept. 4, sharply lower prices in foodstuffs more than offset this increase, causing the Bureau of Labor Statistics comprehensive wholesale price index to decline for the second consecutive week to 167.4 per cent of the 1926 average. Accompanying the decline, raw materials dropped 1 percentage point and manufactured products 1.2 percentage points.



Index (chart above): Week ended Sept. 11 (preliminary) 159 Previous Week 170 Month Ago 170 Year Ago 159

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.0	95.0	94.5	83.0
Electric Power Distributed (million kilowatt hours)	5,166	5,470	5,317	5,053
Bituminous Coal Production (daily av.—1000 tons)	1,981	2,036	2,023	1,789
Petroleum Production (daily av.—1000 bbl.)	5,346	5,531	5,507	5,217
Construction Volume (ENR—Unit $1,000,000)	$106.9	$146.8	$194.4	$146.2
Automobile and truck output (Ward's—number units)	76,792	101,879	112,342	106,095

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

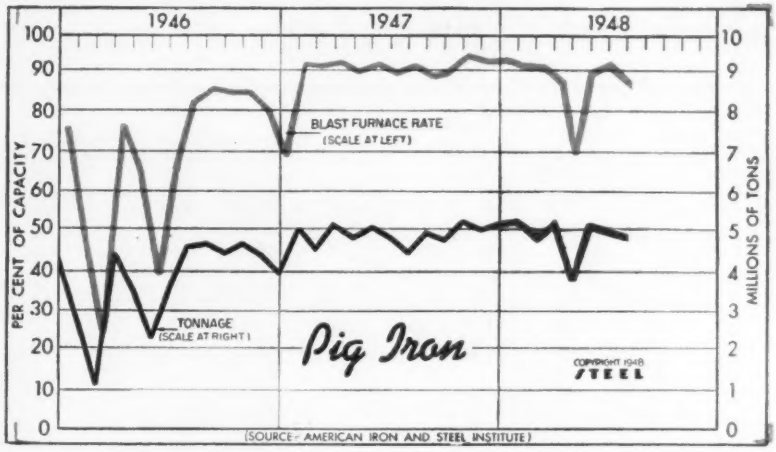
TRADE				
Freight Carloadings (unit—1000 cars)	805†	895	891	922
Business Failures (Dun & Bradstreet, number)	83	94	103	75
Money in Circulation (in millions of dollars)‡	$28,287	$28,072	$27,966	$28,742
Department Store Sales (changes from like wk. a yr. ago)‡	+16%	−8%	+17%	+1%

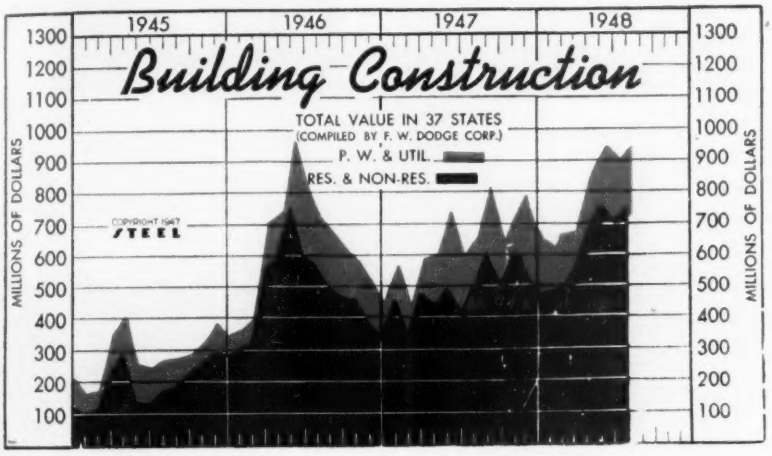
† Preliminary. ‡ Federal Reserve Board.

Pig Iron*

	Production (Net Tons—000)			Operating Rate (% of capacity)		
	1948	1947	1946	1948	1947	1946
Jan.	5,194	5,071	2,644	90.9	90.8	47.4
Feb.	4,838	4,550	1,148	90.6	90.3	22.2
Mar.	5,020	5,123	4,424	87.8	91.8	77.3
Apr.	3,840	4,830	3,614	69.4	89.3	65.2
May	5,077	5,081	2,274	88.8	91.0	39.8
June	4,990	4,810	3,682	90.2	89.0	66.6
July	4,900	4,585	4,705	85.9	90.3	82.4
Aug.	....	4,916	4,898	...	88.1	85.6
Sept.	....	4,801	4,687	...	89.0	84.8
Oct.	....	5,228	4,814	...	93.6	84.1
Nov.	....	5,015	4,435	...	92.8	80.0
Dec.	....	5,177	3,992	...	92.9	69.9
Total	....	59,210	45,318	Ave...	90.1	67.4

* Includes ferromanganese and spiegeleisen.





Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works Utilities		Residential and Non-residential	
	1948	1948	1947	1948	1947
Jan.	615.2	136.6	113.9	478.6	457.7
Feb.	682.0	177.3	90.5	504.6	351.6
Mar.	689.8	164.3	122.0	525.5	474.8
Apr.	873.9	184.7	161.4	689.2	441.0
May	970.8	205.0	252.9	765.8	490.0
June	935.2	215.7	185.7	719.5	419.4
July	962.7	217.9	165.9	744.8	494.4
Aug.	....	....	223.5	....	599.7
Sept.	....	....	141.5	....	508.4
Oct.	....	....	165.9	....	627.4
Nov.	....	....	181.5	....	533.6
Dec.	....	....	154.1	....	471.3
Totals	....	....	1,958.8	....	5,869.3

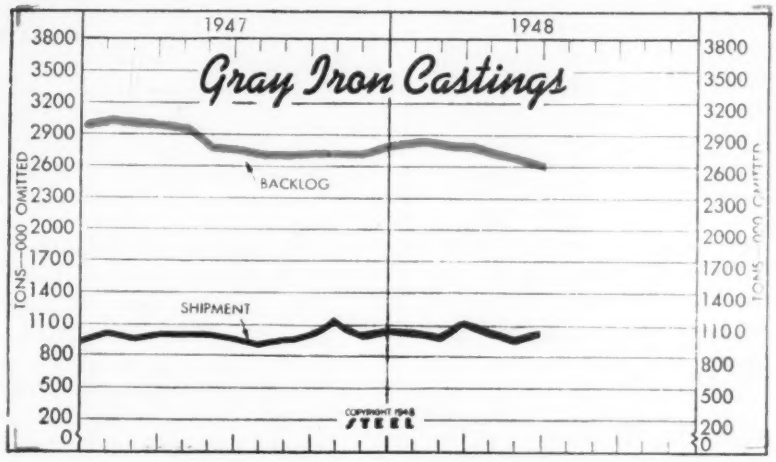
Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1948	1947	1948	1947
Jan.	1,064	1,078	2,803	3,021
Feb.	1,024	1,010	2,769	2,987
Mar.	1,169	1,090	2,726	2,979
Apr.	1,051	1,097	2,691	2,909
May	993	1,097	2,602	2,783
June	1,072	1,038	2,587	2,711
July	....	913	....	2,657
Aug.	....	952	....	2,631
Sept.	....	1,025	....	2,680
Oct.	....	1,154	....	2,669
Nov.	....	1,020	....	2,687
Dec.	....	1,066	....	2,782
Total		12,541		

* Unfilled orders for sale to the trade.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$9,753	$12,341	$11,924	$12,091
Federal Gross Debt (billions)	$252.7	$253.1	$253.2	$259.3
Bond Volume, NYSE (millions)	$12.6	$14.0	$13.5	$18.4
Stocks Sales, NYSE (thousands)	3,962	3,776	3,949	3,718
Loans and Investments (billions)†	$63.2	$63.2	$63.2	$63.8
United States Gov't. Obligations Held (millions)†	$34,686	$34,702	$35,023	$38,354

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$93.86	$93.86	$93.55	$75.41
All Commodities†	167.4	168.4	169.2	154.9
Industrial Raw Materials†	180.7	181.7	184.3	168.5
Manufactured Products†	163.0	164.2	164.3	150.1

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

MORRISON H. WATKINS

GEORGE W. SCHWAGER

KENNETH G. DONALD

Morrison H. Watkins has been appointed controller, Fitzsimons Steel Co. and its affiliated companies, Youngstown. He formerly was executive assistant to the vice president of Unexcelled Chemical Corp.; manager of systems and methods, Bendix Helicopter Inc.; and director of procedures, Sperry Gyroscope Co. Inc. For a number of years Mr. Watkins was consultant on accounting systems and methods, specializing in costs, for a wide variety of industrial concerns.

—o—

Samuel J. Matchett has been appointed manager of the Detroit office of Pratt & Whitney, division of Niles-Bement-Pond Co., West Hartford, Conn. He will head machine tool sales in Michigan, succeeding the late **H. William Kopf,** who was Pratt & Whitney Detroit manager since 1915. Mr. Matchett has been in the Pratt & Whitney Chicago office since 1923.

—o—

Lester B. Hamersley has been appointed sales promotion manager by Firth Sterling Steel & Carbide Corp., McKeesport, Pa. He formerly was assistant sales manager of Signode Steel Strapping Co., Chicago, and previously division manager, Fairbanks, Morse & Co.

—o—

Gustave R. Geiger has been appointed supervisor of quality control, SKF Industries Inc., in the main plants at Philadelphia.

—o—

B. N. Brockman Jr. has been appointed advertising manager, R. K. LeBlond Machine Tool Co., Cincinnati. He has been in charge of the company's export sales, and will continue this activity in addition to assuming responsbilities for the advertising program. Mr. Brockman succeeds **Sidney R. Best,** resigned to join the Cincinnati advertising agency of Perry-Brown Inc., where he will serve as account executive for LeBlond and others.

—o—

Billings & Spencer Co., Hartford, Conn., announces the appointment of **George W. Schwager** as sales manager to succeed **W. Dorsey Endres,** who has resigned. Mr. Schwager was formerly field sales manager for Holo-Krome Screw Corp., Hartford, and has 35 years of experience in the mill supply and wholesale hardware fields. **W. T. Johnson** has been appointed sales manager of the Chicago district, and **John Donaldson** as sales representative in metropolitan New York and upper New Jersey.

—o—

S. C. Lawson, assistant general sales manager of Ampco Metal Inc., Milwaukee, has been appointed general sales manager, succeeding **R. J. Thompson,** who will be located in California where he will serve as engineering and sales manager for Ampco's West Coast activities. Mr. Lawson joined the company in 1938. He is succeeded as assistant general sales manager by **J. P. Henry,** who has been serving as eastern zone manager for the past three years, with headquarters at Hartford, Conn. **E. E. Whitson,** Philadelphia district manager, will assume the duties of advertising manager. Other changes in the sales organization include the transfer of **J. E. Cook** from Cincinnati to Philadelphia as district manager; **F. A. Burnett** from Indianapolis to Cincinnati as district manager; **W. F. Taff** from sales engineer in Indianapolis district to manager of that district.

—o—

Jack & Heintz Precision Industries Inc., Cleveland, announces the resignation of **Byron C. Foy** as chairman of the board and president of the company, and the election of **Kenneth G. Donald** to the office of president. Mr. Donald has served for several months as general manager of the company. He is a vice president of the firm of Robert Heller & Associates, management engineering organization, and will continue in that capacity. The office of chairman of the board has been abolished by Jack & Heintz Precision Industries Inc. Mr. Foy will continue as a director of the company.

—o—

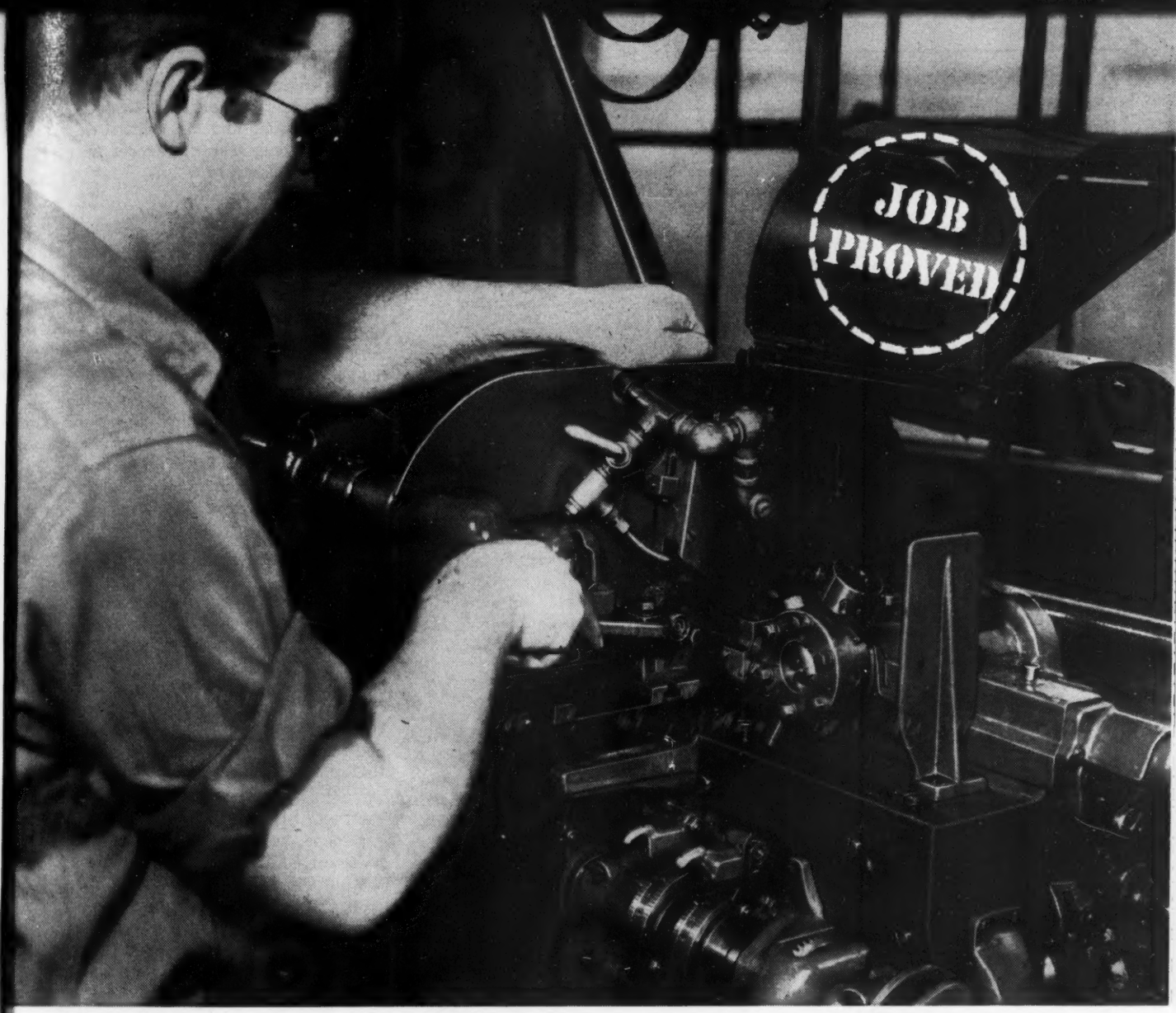
J. Earl Romer has been appointed district sales manager of the Hartford, Conn., office, Bliss & Laughlin Inc., Harvey, Ill. Mr. Romer succeeds **Walter A. Fairchild** of J. Harvey Bryan Co., who has represented Bliss & Laughlin Inc. in western New England for the past 12 years. Mr. Romer has been in charge of Bliss & Laughlin's Cleveland office for the past 10 years, and prior to that time represented the company in Cincinnati.

—o—

William P. Gillespie has been appointed manager, market requirements department, Henry Disston & Sons Co. Inc., manufacturer of saws, tools and special alloy steels, Philadelphia. He has been assistant manager of sales in the Hardware Division since 1944.

—o—

Harbison-Walker Refractories Co., Pittsburgh, announces the promotion



TOOL LIFE TRIPLED

Sunicut with Petrofac* Improves Finishes and Lengthens Tool Life in Intricate Machining Job

In the machining of small parts for radios, a shop was using a dark cutting oil with poor results. Finishes were rough, tool life was unsatisfactory. The dark oil made the work hard to see.

Changing to Sunicut with Petrofac, the plant found the ideal oil for its purpose. Its cooling and lubricating qualities are producing excellent finishes, and increasing tool life from 10 hours to 30 hours. Further, machinists can see the work better through this transparent oil.

Job: Turning, forming, threading, pointing
Machine: Brown & Sharpe OOG Automatic
Part: Stud pulley for radio
Material: B 1112 steel
Tools: Rex AA high-speed circular form tools
Spindle Speed: 2,600 R.P.M.
Cutting Speed: 165 S.F.P.M.

These new grades of Sunicut with Petrofac are making possible better finishes than ever, and faster work in a wide range of operations. The new Sunicut grades with Petrofac possess superior metal-wetting, anti-weld, and extreme-pressure qualities. They are not blended with animal or vegetable fatty oils—cannot turn rancid. For additional information about the various Sunicut cutting oils, write for folder S-9.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

*Petrofac is a trademark of Sun Oil Company.

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

of **Hugo L. Harrod** as district superintendent of the Missouri works. He formerly was plant superintendent at Fulton, Mo. In his new capacity, Mr. Harrod will supervise operations of both the Fulton and Walsh Works.

—o—

Howard A. Baum has been appointed manager of office equipment sales of Berger Mfg. Division, Republic Steel Corp., Cleveland. He started with the Berger Mfg. Division in 1939. Following service in the Army as a major in the infantry during World War II, Mr. Baum returned to selling for the division in Harrisburg, Pa.

—o—

George C. McClure, purchasing agent for North American Refractories Co., Cleveland, for the past 18 years, will retire Oct. 1, to make his home in San Francisco. Prior to his connection with the North American Refractories Co., he was purchasing agent for American Rolling Mill Co., Middletown, O., and for many years was associated with Wheeling Steel Corp. at its Portsmouth, O., plant. His successor with North American Refractories Co. will be **Robert L. Lehr,** his former assistant.

—o—

Robert J. Hoffman has been named meter and instrument specialist in the San Francisco office of General Electric Co. **V. E. Dodson** has been appointed assistant to **Allen G. Jones,** Pacific district manager of the apparatus department, General Electric Co.

—o—

Baldwin Locomotive Works, Philadelphia, announces appointment of **Curtis G. Green** as manager of its Chicago district office, succeeding **D. I. Packard,** resigned. Mr. Green has been connected with Baldwin since 1920 in various sales and engineering capacities. Closely connected with the company's diesel-electric locomotive activities, for the past two years he has been manager of sales in Mexico, spending a great part of his time in that country.

—o—

E. H. Mebs, formerly division superintendent - foundries, Johnstown-Lorain Works, Carnegie-Illinois Steel Corp., has been appointed to the newly created position of works manager for Machined Steel Casting Co., Alliance, O.

—o—

Joseph W. Farley has been appointed manager of sales, miscellaneous steel castings for McConway & Torley Corp., Pittsburgh. Prior to joining the corporation, he served as a sales engineer with Chester Electric Steel Co., Chester, Pa., Fort Pitt Steel Castings Co., McKeesport, Pa., and with Lobdell Co., Wilmington, Del. In his new position Mr. Farley will head sales activity for the corporation's Pittsburgh plant, and for its subsidiary, Baltimore Foundry & Machine Co., Baltimore, whose headquarters have been transferred to Pittsburgh.

—o—

P. J. Jensen, formerly executive engineer in the engineering and research department at Carboloy Co. Inc., Detroit, has been appointed to the position of manager of the Michigan district, with headquarters at Detroit. Mr. Jensen succeeds **M. E. Knoll,** who is retiring after 19 years' service with Carboloy, 18 of which he spent as manager of the Michigan district. Mr. Jensen joined the company in 1936, served in the U. S. Army Ordnance Department during the war, and returned to Carboloy in 1946 as executive engineer, in which capacity he served until his present appointment.

—o—

John A. Meyer, National Alloy Steel Division, Blaw-Knox Co., Pittsburgh, will assume the duties of president, Pittsburgh Foundrymen's Association, for the 1948-49 term in the absence of **C. B. Dick,** who has been transferred to East Springfield, Mass., as works manager of the Westinghouse Electrical Appliance Division. Mr. Meyer had previously been elected vice president of the association. He will be succeeded in that capacity by **R. G. Schaefer,** Schaefer-Goodnow Foundries Inc., Pittsburgh. **E. P. Buchanan,** Pittsburgh Coke & Chemical Co., is secretary-treasurer of the group.

—o—

Paul R. Curtis Jr. has been appointed general sales manager, Plume & Atwood Mfg. Co., Waterbury, Conn., and **Ernest C. Britton** has been named to the newly created position of sales engineer. Mr. Curtis has been assistant sales manager, Silex Co., Hartford, Conn., and Mr. Britton was chief sales engineer of Veeder-Root Inc., also at Hartford.

—o—

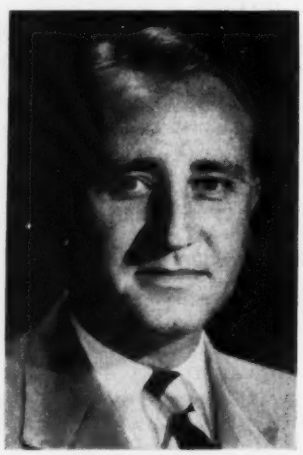
Farrel-Birmingham Co. Inc., Ansonia, Conn., announces appointment of **Carl F. ter Weele** as export manager. He will make his headquarters in the New York office. Preceding World War II Mr. ter Weele was associated with the Export Sales Division, Philips-Eindhover, the Netherlands, and following service as an officer in the Royal Netherlands Army during the invasion of 1940, and subsequent service in Canada, Mr. ter Weele became connected with Remington Rand Inc. as an export division executive.

—o—

Robert A. Wallace has been appointed chief engineer, McDowell Mfg. Co., Pittsburgh. Formerly associated with General Electric Co., Armstrong Cork Co., and Carnegie-Illinois Steel Corp., and more recently with Carnegie Institute of Technology as an associate professor of management engineering, Mr. Wallace established his private practice in 1943, the Robert A. Wallace Co., Pittsburgh.

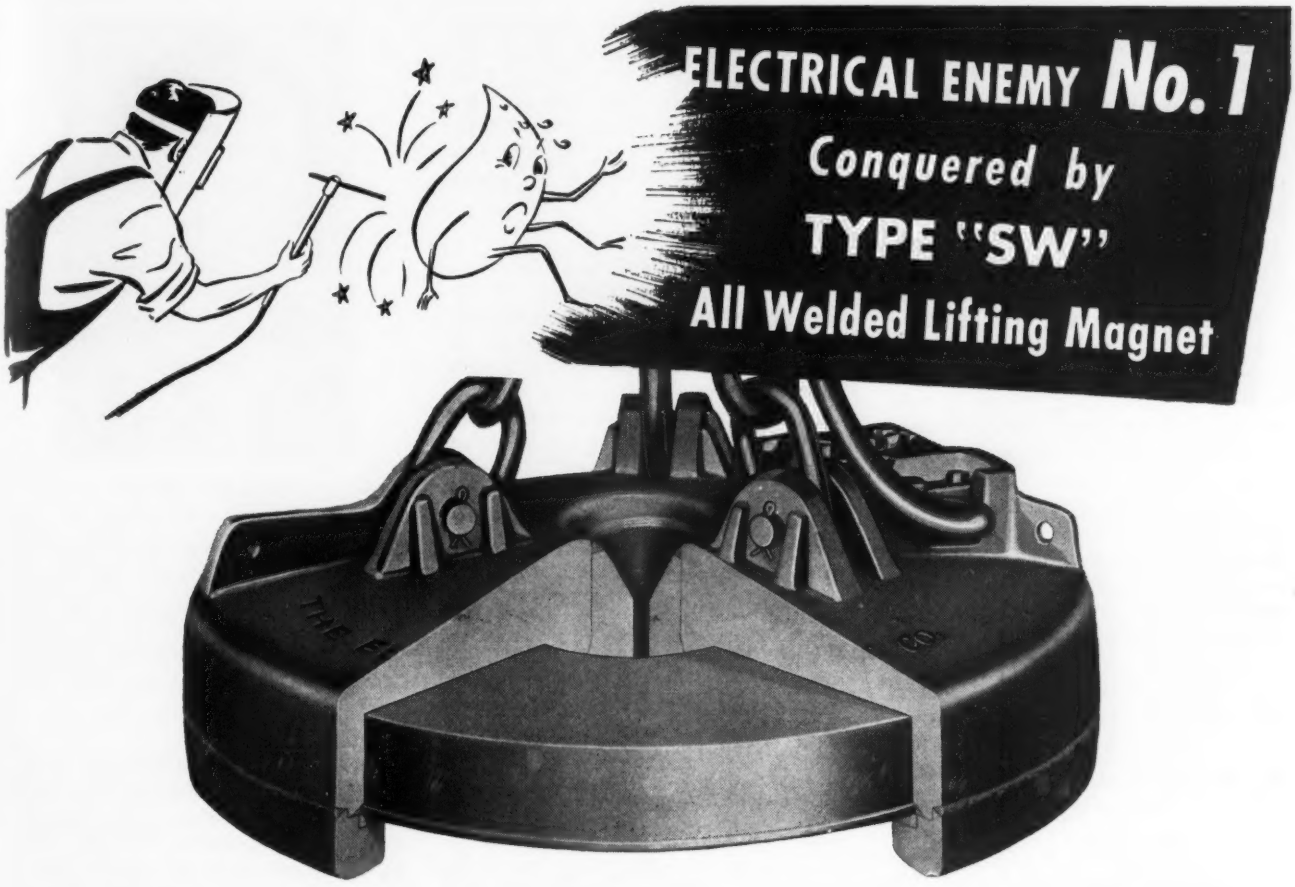
—o—

Paul S. Strecker, assistant to the president, has been appointed works manager of the Toledo, O., Machine & Tool Division, E. W. Bliss Co., Detroit. **R. E. Hinde,** formerly works manager at Toledo, is continuing at the Toledo plant as assistant to the works manager handling special assignments. Prior to his association with Bliss, Mr. Strecker was the first personnel director of Fisher Body Division's Grand Rapids, Mich., plant, and left General Motors Corp. to become associate professor of general engineering at Purdue University. He later joined Nash-Kelvinator Co. at its aircraft plant in New Orleans,

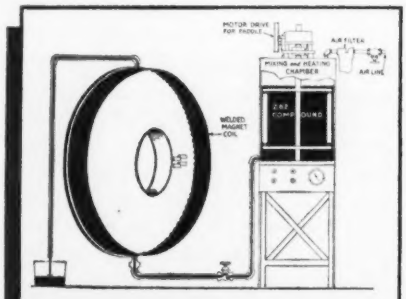


PAUL R. CURTIS Jr.

PAUL S. STRECKER



Not a *Single Case* of Moisture in Magnet-Winding

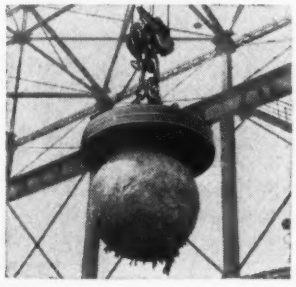


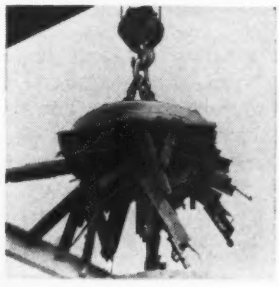
Longer Magnet Life, because –

1. Coil is jacketed in a welded steel case after winding.
2. Heated to drive out all moisture.
3. Filled with EC&M No. 282 compound —bottom filling eliminates air pockets.
4. Compound is thermally set by baking—provides a stable but resilient insulator between winding and case—does not melt nor become brittle.
5. Coil-case is sealed into magnet-housing by continuous welds. A water-tight coil within a water-tight housing gives double protection against moisture.

The problem of preventing moisture entrance into the magnet-winding has been mastered in the EC&M Type "SW" *All-Welded* Lifting Magnet. Hundreds of these *all-welded* magnets have been operating under all kinds of climatic conditions and there has *not* been *one* case of moisture in the coil-winding.

Lifting Magnet's Enemy No. 1 has *lost*. This destroyer of insulation, this promoter of grounds and shorts has been soundly whipped. Only EC&M's Type "SW" Magnet is completely welded for permanent protection. Ask for Bulletin 900 describing this advanced lifting magnet design.





E&M

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

and its propeller plant at Lansing, Mich.

—o—

John H. Poulson has been appointed to the board of regional sales supervisors, Eutectic Welding Alloys Corp., New York, covering eastern United States and Canada.

—o—

Appointments in the sales staff of the New Departure Division, General Motors Corp., at Bristol, Conn., have been announced as follows: **Lorne F. Lavery,** formerly manager of the Detroit office, becomes assistant general sales manager at Bristol; **Charles D. McCall,** formerly manager of automotive sales at Detroit, succeeds Mr. Lavery as manager of the central region; **Howard A. Offers,** sales engineer in the Chicago territory, becomes manager of the mid-western region, with headquarters in Chicago; and **Raymond J. Lynch,** formerly engineer of the Chicago office, is now supervisor of engineering for the central and mid-western region.

—o—

Dr. Donald H. McLaughlin has been appointed as a director of International Nickel Co. of Canada Ltd., succeeding **William N. Cromwell,** who died recently. Mr. McLaughlin is president of Homestake Mining Co., San Francisco.

—o—

Thomas A. Murphy has been appointed sales manager for Steel Distributors Inc., Philadelphia.

—o—

John W. Hill has been appointed general superintendent of operations in the Colorado area for United States Vanadium Corp., unit of Union Carbide & Carbon Corp., New York. He has been acting superintendent in that area. **David D. Baker** has been appointed manager of tungsten operations of United States Vanadium Corp., in charge of all operations at Bishop, Calif., and Henderson and Winnemucca, Nev.

—o—

Dr. Carl F. Prutton, formerly head of the department of chemistry and chemical engineering, Case Institute of Technology, has joined Mathieson Chemical Corp. as director of research. He will have headquarters in New York and at the research laboratories in Niagara Falls, N. Y.

—o—

George D. Ramsay, vice president and general manager, Lone Star Steel Co., Daingerfield, Tex., has been promoted to vice president of operations, and will move from the Lone Star Works to the executive offices in Dallas. He will continue to have general supervision over all operations, but will devote a major part of his time to study and execution of the proposed program of adding finished steel manufacturing facilities to the Lone Star Works. **William R. Bond,** general superintendent, has been promoted to works manager.

—o—

Ex-Cell-O Corp., Detroit, announces the following promotions in the executive personnel of the company: **James K. Fulks,** vice president in charge of manufacturing, becomes a director of the company as well as an active officer. **John F. Miller,** engaged in sales work for a number of years with the company, becomes sales manager, Machine Tool and the Cutting Tool Divisions. **D. H. McIver,** also engaged in sales work, becomes sales manager of the Aircraft and Miscellaneous Parts Divisions.

—o—

Willard Morrison, manager of supply and inventory for the foreign operations group of International Harvester Co., Chicago, has been appointed deputy director, agricultural machinery branch of the Industry Division, Economic Cooperation Administration, at Washington.

—o—

Harold G. Williams, formerly chief metallurgist, Instrument Specialties Co., Little Falls, N. J., has been appointed director of sales and engineering for H. Braun Tool & Instrument Co. Inc., Hawthorne, N. J. Mr. Williams will concentrate on customers' problems on short run, nonferrous stampings, with particular reference to beryllium copper.

—o—

Washington Steel Corp., Pittsburgh, announces appointment of **John C. Richards,** associated with the company as manager of distributors' sales since December, 1947, as general manager of sales. He had previously been assistant general sales manager of Eastern Stainless Steel Corp., with which company, and its predecessor, he had been associated for 23 years.

—o—

William H. Starbuck has been appointed assistant general sales manager, Kellogg Division, American Brake Shoe Co., New York. Formerly sales representative, Mr. Starbuck has served in various sales capacities since first joining the company. His headquarters will be at Rochester, N. Y.

—o—

Russell T. Shafer has been appointed manager, Publicity Division, Westinghouse Air Brake Co., Wilmerding, Pa. He succeeds **James A. Ralston,** retired, who held that position since

JOHN S. CONWAY

1920. Mr. Shafer joined the company in 1926 in the auditing department, transferred in 1934 to the patent department, and has been associated with the publicity department since March of this year as assistant manager.

—o—

John S. Conway, formerly export sales manager, Koehring Co., Milwaukee, has been appointed general sales manager of the company. **John E. Chadwick** has been named assistant sales manager, and **R. E. Stewart,** export sales manager. In his new post, Mr. Conway succeeds **J. F. Robbins,** who will become president and general manager of Capitol Equipment Co., a distributor in Harrisburg, Pa., for Koehring Co.

—o—

Dr. A. B. Parsons has resigned as secretary of the American Institute of Mining & Metallurgical Engineers, after serving 18 years in that position. The resignation becomes effective in February, 1949; in the meantime Dr. Parsons will be on leave of absence. **E. H. Robie,** who has been Dr. Parsons' principal assistant during nearly all of his tenure of office, will be acting secretary during the remainder of the year.

—o—

Acme Steel Co. of Canada announces the election of **John K. Corley** as president, and **C. J. Sharp** and **J. E. Ott** as vice presidents. Mr. Corley, who was formerly vice president, has represented Acme Steel Co. of Chicago in Canada for 32 years.

—o—

Vanadium-Alloys Steel Co., Latrobe, Pa., announces transfer of **James G. Miller** to its Chicago office. Mr. Miller previously was employed as a representative in the St. Louis office.

—o—

Doran L. Bellamy, manager, Milwaukee branch, Diebold Inc., has

HARRY L. SPENCER
Appointed director of manufacturing, Norge Division plants, Borg-Warner Corp., Chicago. Noted in STEEL, Sept. 13 issue, p. 96

PARKER F. WILSON
Who has been elected president and director, Kerotest Mfg. Co., Pittsburgh. Noted in STEEL, Sept. 13 issue, p. 96

W. F. ARMSTRONG
Appointed general manager, Chevrolet Motor Division, General Motors Corp., Detroit. Noted in STEEL, Sept. 13 issue, Mirrors of Motordom

been transferred to the general offices at Canton, O., as assistant sales manager, Systems Division.

—o—

R. C. Stobert, for 15 years vice president and general manager, Hardie-Tynes Co., Birmingham, has been elected president of the company. Mr. Stobert succeeds **W. P. Tynes,** who died several months ago.

—o—

Ray H. Sullivan has been appointed assistant general manager of Rouge automotive operations at Ford Motor Co., Dearborn, Mich. He has been active in Detroit for the past two years as vice president in charge of manufacturing for E. W. Bliss Co. At the Rouge plant, Mr. Sullivan will assist **Logan C. Miller** in overall manufacturing operations which include foundry and castings machine shop, motor building, pressed steel and related activities.

—o—

Harbison-Walker Refractories Co., Pittsburgh, announces appointment of **R. B. Jenner** as head of the company's Refractory Plastics and Castables Division. He has been serving with the Boston sales office of the company.

—o—

H. B. Brown has joined the Fireproof Building Materials Division, Inland Steel Products Co., Milwaukee. He was formerly with United States Gypsum Co. in a similar capacity.

—o—

Harold S. Swanson has been appointed traffic manager, Charles Williams & Associates Ltd., steel exporter located in New York. He formerly was with U. S. Steel Export Co.

—o—

George L. Best, vice president in charge of patent licensing activities, Western Electric Co., New York, manufacturing and supply unit of the Bell System, has been named vice president of finance, to succeed **T. Kennedy Stevenson,** who will retire Nov. 30. Mr. Best will continue to be responsible for patent licensing.

OBITUARIES . . .

Aldus C. Higgins, 75, for nearly a half century identified with Norton Co., Worcester, Mass., died Sept. 10. At the time of his death, Mr. Higgins was chairman of the company's executive committee. He joined Norton Co. in 1900 as patent counsel, and served in many executive positions, including that of president, general manager and chairman of the board of directors.

—o—

Joseph H. Hazley, for more than 25 years connected with Jacobs Mfg. Co., Hartford, Conn., died recently. He served as sales manager for many years, and was also a vice president of the company at the time of his resignation from active service in 1945. He retained his membership on the company's board of directors until the time of his death.

—o—

Emil R. Gasser, 44, chief physicist, Farrel-Birmingham Co. Inc., Ansonia, Conn., died recently at his home in Buffalo. He joined Farrel-Birmingham in 1928, and for the past three years has been director of research activities, with headquarters at the laboratory of the company's Buffalo plant.

—o—

Samuel Diamond, president, Continental Iron & Metal Co., Chicago, died Sept. 8. He had been in the metal business in Chicago since 1910, and organized the Continental Iron & Metal Co. in 1934.

—o—

Eugene A. Ford, 82, engineer and inventor, who had been associated with International Business Machines and its predecessor companies, New York, since 1904, died recently.

—o—

Gunnar Jensen, 49, chief engineer, Walker Mfg. Co., Racine, Wis., died recently.

—o—

Albert T. de Forest, 85, at the time of his retirement 15 years ago president of Columbia Steel Co., Pacific Coast subsidiary of U. S. Steel Corp., died recently. He had held that office since the formation of the company in the early 1920s. Associated with the corporation's subsidiary companies for many years, Mr. de Forest served at one time as Cleveland district general manager, American Steel & Wire Co.

—o—

L. S. Austin, 57, civil engineer, Woodward Iron Co., Woodward, Ala., died Sept. 11.

—o—

Selbert M. Johnson, 53, former president, Jamestown Electro Plating Works, Jamestown, N. Y., died recently.

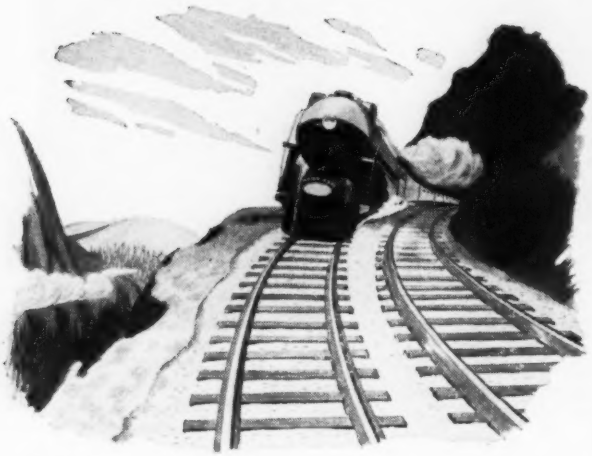
—o—

Arthur W. Heinze, 59, consulting engineer, and vice president of M. P. Heinze Machine Co., Chicago, died Sept. 10 at Kenosha, Wis.

—o—

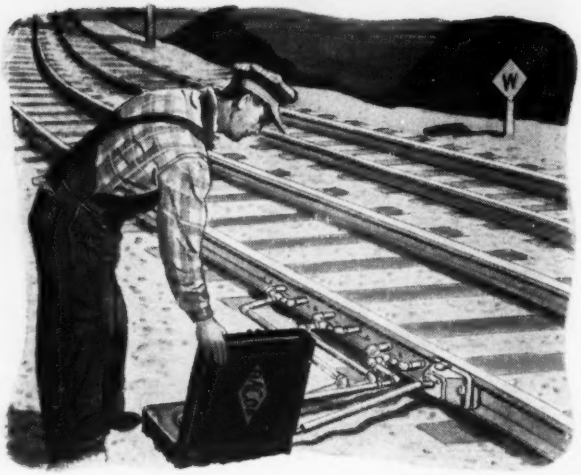
Charles M. Sackerson, 62, divisional superintendent of cold rolling in the Cuyahoga mills of the American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp., died Sept. 13.

Let Morse grease the rails for your tough jobs too!



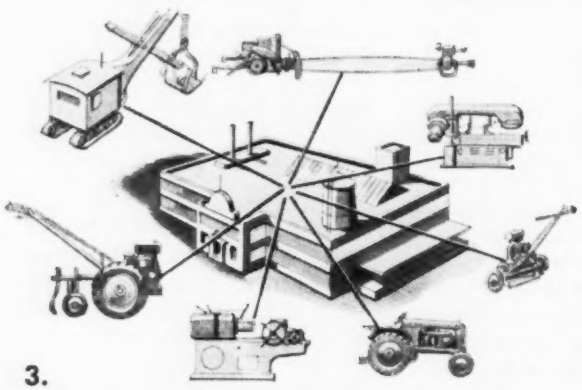
1.

Sc-r-r-ee-ch! Railroad men know this noise means that expensive train wheels and rails are wearing away on curves. To prevent this wear, automatic greasers were installed to lubricate wheels and rails. Old-style ratchet type clutches were tried, but slipped or didn't feed grease right. American Brake Shoe Company's Ramapo Ajax Division solved this knotty problem...



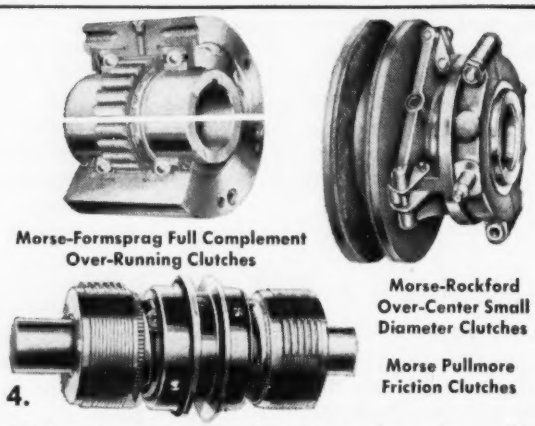
2.

They now use Morse-Formsprag Clutches. The positive action of Morse-Formsprag Clutches is far superior in performance, dependability and service over the old ratchet type. *M-F Clutches engage instantly; allow no back-slip; feed grease to every passing wheel.* Other complex operations on your products may call for Morse-Rockford Friction Clutches...



3.

Morse clutches fill almost every need you can imagine. Can the sales and mechanical value of your own products be enhanced by using Morse clutches? Leading manufacturers of such items as construction equipment, cultivators, saws, pumps, lawn mowers and machine tools have bettered *their* products with Morse clutches. How about you? Do this now...



Morse-Formsprag Full Complement Over-Running Clutches

Morse-Rockford Over-Center Small Diameter Clutches

Morse Pullmore Friction Clutches

4.

Write for expert clutch engineering aid and consultation. For new ideas, send for clutch catalogs: Morse Formsprag Clutch Catalog, No. C11-48; Morse Pullmore Clutch Catalog, C31-47; Morse-Rockford Clutch Catalog, SDOC. Address: Morse Chain Company, Department 222, 7601 Central Avenue, Detroit 8, Michigan.

Morflex Couplings

Roller Chain Couplings

Silent Chain Drives

MORSE

MECHANICAL POWER TRANSMISSION PRODUCTS

A PRODUCT OF B-W BORG-WARNER

Morflex Radial Couplings

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

Engineering News
. . . AT A GLANCE

HUGE COAL "EATER"— To build the mammoth battery of 106 by-product coke ovens, charged recently at the Aliquippa Works of Jones & Laughlin Steel Corp., it required approximately 750 railroad carloads of material, and it will require 40 carloads of coal each 24-hour period to keep the battery in operation. The ovens are arranged in a single battery, consisting of two groups of 53 ovens each, separated by a fire clay bulkhead. Each oven has a capacity of 17¼ net tons of coal at 50 pounds per cubic foot, and coal is carbonized at the rate of 1 inch per hour. Whole battery is capable of carbonizing 2500 tons of coal per day. The addition provides the works with a total of 293 by-product coke ovens—capable of processing about 7000 tons of coal per day.

QUENCHES METAL "FEVERS"— Blazing metal chips, a hazard in many machining operations involving magnesium and aluminum, now can be extinguished by a fire-fighting fluid in which castor oil is a major constituent, it is learned from the Patent Office, Washington. Sprayed from the tank of a fire extinguishing apparatus, the patented fluid—assigned to Lockheed Aircraft Co.—which also includes dispersed carbon dioxide gas in sufficient quantity to form a fluent foam, is reported to be highly successful in penetrating quantities of burning metal cuttings, smothering the flames and cooling the remaining metal.

"SHOT-IN-THE-ARM"— In low temperature production of GR-S synthetic rubber, United State Rubber Co., it is learned, speeds up the process with the use of four chemicals—dextrose sugar, ferrous sulphate, sodium pyrophosphate and cumen hydroperoxide. First three are activators and the fourth a catalyst. Reactor vessels at the company's Borger, Texas, plant, where the process was initiated, have double walls with refrigerant circulated between them, and an 8-inch outer sheath of cork and asbestos. The "speed-up" chemicals serve to shorten the low-temperature reaction from a period of many weeks to about 12 hours.

AIDS TRUCK ENGINEERING— To test axle shafts, crankshafts, frame and body members of buses and trucks, engineers of Mack Trucks Inc. are using a new type torsion machine developed by Baldwin Locomotive Works, to aid them in selecting steels and alloys for these parts, and to determine best heat treaments. The machine which is being used in the company's Plainfield, N. J. laboratory, has a maximum capacity of one million inch pounds, and is large enough to test bars or tubes up to 10 feet long and 6 inches in diameter. Torsional loads can be measured in either direction of rotation.

NEW "TOOL" FOR AUTO MAKERS— Cyril Bath Co., Cleveland, is offering automotive industries a unique service in form of a new technique in metal shaping—a process which is said to be designed for making metal parts and formations difficult to produce economically by conventional methods. The service, a rotary stretch forming process, provides unusual advantages in stretch forming materials such as stainless-clad steel where the surface may be readily marred in regular dies. In sheet contouring, chief advantage of the method is that shapes can be produced up to 250 degrees. When forming flanged sheets, curvature is limited to a large extent by amount of stretch which the main body of the sheet can tolerate in producing an inner radius free from wrinkles.

RATE - OF - WEAR DETECTOR — Ability of a bearing material to run on a journal metal under controlled conditions is investigated with a compatability tester in General Electric's bearing and lubricants center at its Thomson lab. Observations include degree of scuffing, welding and pick-up on journal material, temperature rise, coefficient of friction and rate of wear. Apparatus consists of an 1800 - revolutions - per - minute motor shaft of which carries a test ring 1½ inches in diameter made from the journal material under test. Against it is held by spring pressure a ¼-inch square sample of the bearing material under observation with its face curved to fit the ring. (p. 94.)

PLANT "MUSCLEMEN" — Out on the West Coast, two stationary air compressors supply much of the "energy" in processing spring steel products in the plant of United States Spring & Bumper Co. Besides furnishing power to simple air tools, units also aid in shaping metals. In the farm tool department, for example, a specially-designed machine is used for coiling cultivator shanks. While the bar is still hot after shearing, it is clamped in the machine's turntable. An air-operated cam at the center of the machine provides the coiling action, and an air piston beneath the machine brings up the mandrel during the turning action. Cushioning characteristic of compressed air helps put a double coil in the spring steel bar. (p.110.)

TESTS OF LITTLE VALUE—Since about 10 years ago when Carnegie-Illinois Steel Corp. began electrolytic coating strip steel with tin, speed of strip travel through the coating lines gradually increased as result of mechanical improvements, incorporation of longer plating tanks and use of higher current densities. In studying effect of variations in electrolyte composition and temperature upon the character of the tin deposit, it was soon recognized that still plating tests were of little value because of the extremely low current densities permissible in comparison with plating carried out upon a rapidly moving cathode. (p. 116.)

Bearing and Lubricants

...ANALYZES ELECTRICAL

Company aims to obtain basic engineering information and co-ordinate effort of product development engineers through laboratory work. Procedure expected to act as a stimulant toward more widespread utilization of new ideas and practices in the engineering groups

DEVELOPMENT of the most efficient and economical bearing possible for electrical machinery applications by obtaining basic engineering information and co-ordinating the effort of product development engineers is the goal of General Electric Co., Schenectady, N. Y., in establishing a bearing and lubricants center at its Thomson Laboratory. Four general fields of interest have been covered including: Sleeve bearings and bearing materials, antifriction bearings and their lubricants, oils and greases.

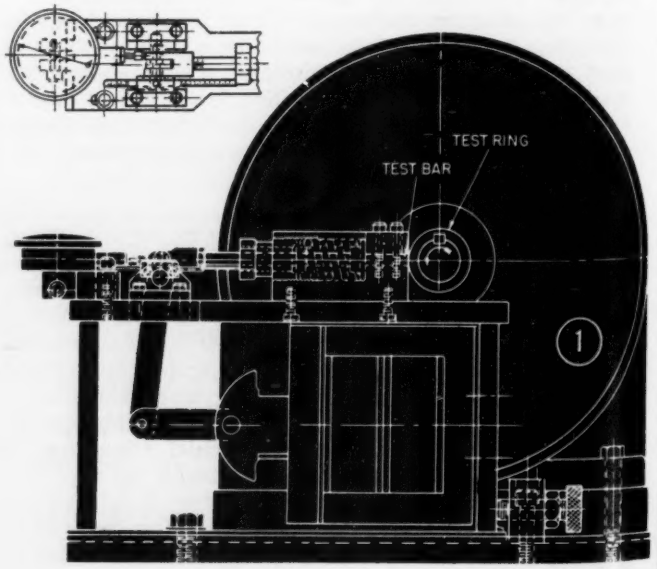
Work is done on basic problems in addition to the study and evaluations of new materials and methods, and information is interchanged with product development engineers. In this way it is expected that the laboratory will not only obtain new and better methods of lubrication and materials but will also act as a stimulant toward more widespread utilization of new ideas and practices in the engineering groups.

Almost all of the equipment in this new center has had to be designed specifically for the laboratory after a careful survey of the requirements, since there are very few standard types of test equipment in the field of bearing and lubrication testing. A constant temperature of 75° F is maintained in the room, and the circulated air is cleaned with electrostatic filters in order to provide the best possible conditions for clean and controlled experiments.

Compatability Tester—Ability of a bearing material to run on a journal material under controlled conditions is investigated with the compatability tester. Observations include the degree of scuffing, welding and pickup on journal material, temperature rise, coefficient of friction and rate of wear.

This apparatus, Fig. 1, consists of an 1800 revolution per minute motor whose shaft carries a test ring 1½-inches in diameter made from the journal material under test. Against it is held by spring pressure a ¼-inch square sample of the bearing material to be tested with its face curved to fit the ring. Spring loading may be adjusted from 150 to 3500 pounds per square inch. Rate of wear is determined by means of a dial indicator in units of 0.0001-inch and for long runs recording is by means of a cantilever beam carrying resistance strain gages. Coefficient of friction is determined from wattmeter record showing additional wattage consumed by the material when the sample is rubbing on the ring.

Lubricating Failure Simulated—Most useful test method has been found to be that of starting the test with one drop of oil on the test path and permitting the test to run without further lubrication until wear of the bearing material takes place. This corresponds roughly to the situation which might be encountered in a bearing whose lubrication has failed for one reason or another. Length of time a sample will run before wear occurs, called the "dwell period," is an indication of the ability of a bearing made from such a material to run with scanty lubrication in practice



Center

CAMACHINERY PROBLEMS

By DONALD F. WILCOCK
Thomson Laboratory
General Electric Co.
Lynn, Mass.

under emergency conditions. Rate of wear, after wear begins, is indicative of the ability of the bearing material to resist galling and wear. Accompanying table gives an example of dwell and wear determinations by comparing three bearing alloys.

Journal bearing test stand was designed to obtain accurate operating data on commercial designs of journal bearings in order to permit refined design calculations of power loss, oil flow and temperature rise. In addition, it was designed to permit testing under bearing loads and at surface speeds far exceeding current practice. A 200 horsepower electric motor drive is provided to supply ample power for operation under extreme conditions.

Drive is from a low speed, direct current motor through 20 to 1 setup gears to the test shaft. Motor characteristics permit full power to be obtained over the range from 5000 to 30,000 revolutions per minute at test shaft. Amplidyne speed control permits precise adjustment and maintenance of any desired speed.

Test Stand Details—Test stand is shown in Fig. 2, and in its basic elements comprises a test shaft carried on two support bearings and carrying in the center the test bearings and its housing. The test bearing is loaded hydraulically from a high pressure

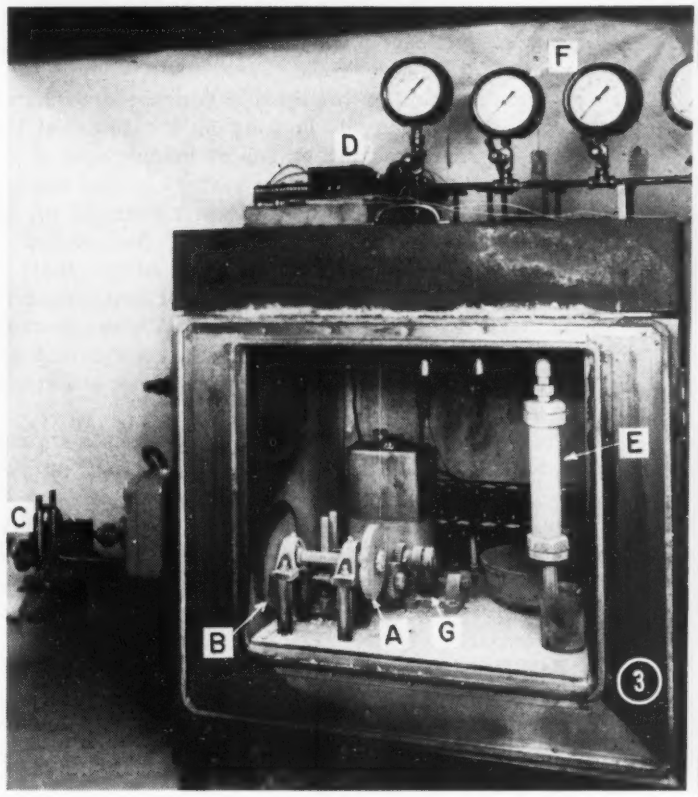
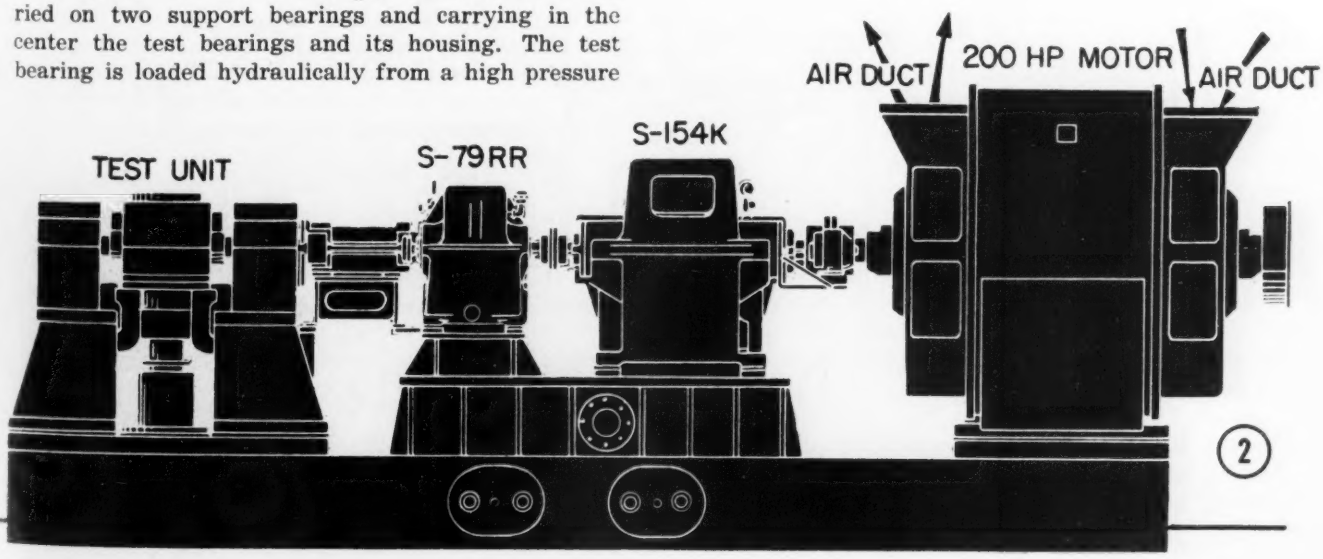


Fig. 1—Sample of bearing material to be tested is held against a test ring made of journal material and rate of wear is determined by means of a dial indicator

Fig. 2—Journal bearing test stand designed to obtain accurate operating data on commercial designs in order to permit refined design calculations of power loss, oil flow and temperature rise

Fig. 3—Low temperature torque tester and pressure viscosimeter, showing: (A) Test bearing and housing, (B) chain drive, (C) reduction gearing, (D) cantilever beam, (E) grease cylinder, (F) oil pressure gage and (G) oil pump



cylinder located in the base, which is capable of applying a vertical upward reaction on the bearing housing of 135,000 pounds.

Torque reaction on the bearing housing is measured directly by floating the housing on a cylindrical 120 degree pressure bearing on top of loading piston. By supplying high pressure oil to pockets in this bearing it is possible to obtain frictionless movement of the test housing despite the loads being transmitted to it from the loading piston. Location of the shaft in the bearing is determined by means of magnetic coils mounted near shaft on housing. Gap between shaft and armature of these coils affects their reluctance and so permits gap to be measured. Coils are standard magnetic strain gages.

Preliminary test results obtained with this apparatus indicate that it will fulfill its function successfully. Good f vs. $\frac{ZN^*}{P}$ curves have been obtained for a number of bearings and informative pressure and temperature distributions in these bearings have been measured.

Ball Bearing Grease Testers—Sectional view of the construction of high temperature ball bearing grease testers is shown in Fig. 4. They comprise a four bearing set which carries both radial and axial loads. Bearings now being used are No. 306 and are operated at 3600 revolutions per minute. Temperature of the air circulating over the test unit inside the enclosures is controlled, and tests are usually run at 100° C and 150° C.

Average operating life of greases is being determined by obtaining the average of 8 to 10 failures per grease. Comparative performance of both commercial and experimental greases is being determined in order that only better lubricants need be tested in actual equipment by product design engineers.

Material	Dwell Period in Minutes		Rate of Wear in Inches per Hour	
	250 psi	500 psi	250 psi	500 psi
A	2	6	0.295	0.558
B	35	8	0.031	0.027
C	22	19	0.026	0.200

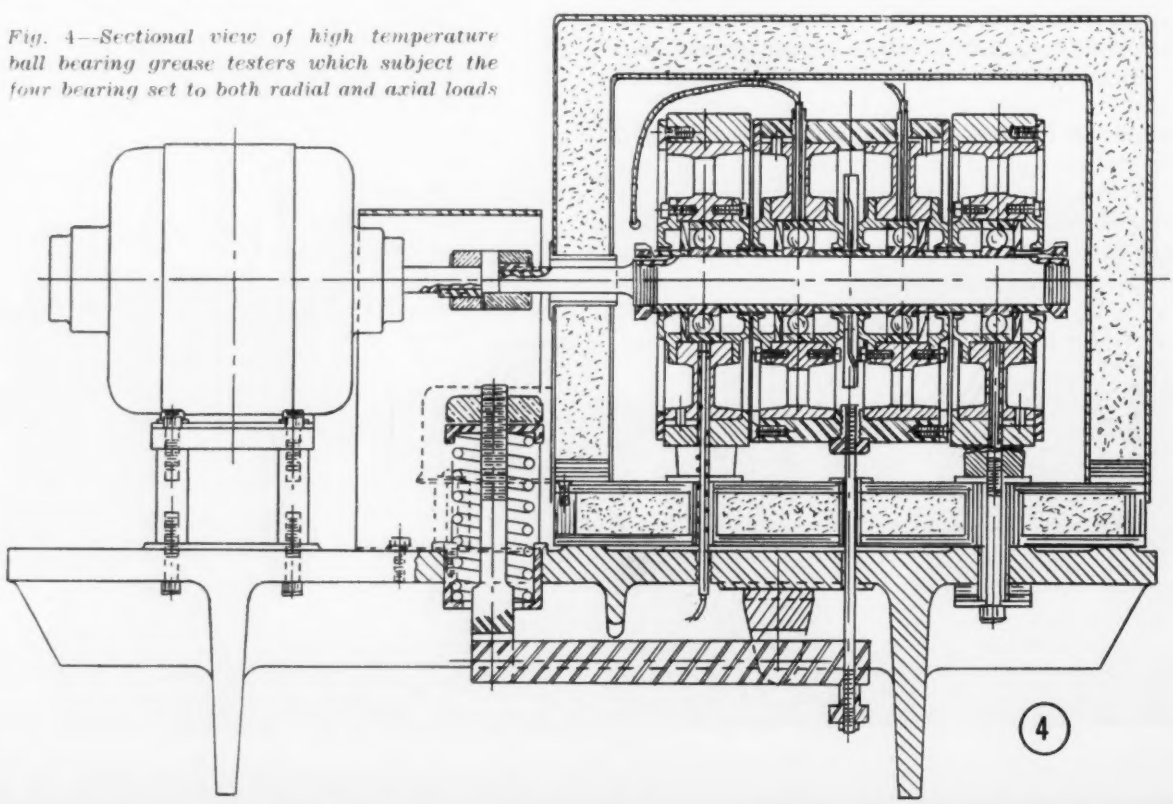
High speed grease testers are very similar to high temperature testers. The principal difference is that high radial loads are not applied and the operating speed is approximately 11,000 revolutions per minute. No. 203 and No. 207 bearings are used in these testers. Results to date indicate considerable shorter life in the high speed bearings than in the 3600 revolutions per minute tests at the same test temperatures.

Physical Test Apparatus—Apparatus for physical tests includes a Brush surface analyzer and an electrical comparator gage. Radial play of ball bearings is measured with an apparatus which has a series of adapters that permit measurement of various bearing sizes. Its operation and that of an instrument for measuring bearing end play is the same. One race of the bearing is clamped in position while the other race is moved first in one direction and then in the opposite direction by equal forces. The amount of motion is read by means of a dial indicator.

Apparatus for the physical and chemical studies of greases and oils includes a modified pressure viscosimeter for determining the flow properties of greases as a function of shearing stress and temperature, a device for measuring the low temperature starting torque of greases in small ball bearings, Fig. 3, a motorized grease worker, American Society for Testing Material penetrometer, Norma-Hoffman oxidation bombs, ovens used for the determination of bleeding and evaporation rates, viscometric apparatus for oils.

The f vs $\frac{ZN}{P}$ curve for a journal bearing is a plot of coefficient of friction versus the dimensionless variable $\frac{ZN}{P}$. Z refers to the absolute viscosity of the oil in the bearing, N is shaft speed and P is average unit load on the bearing in pounds per square inch. It is a curve characteristic of bearings of same design, same length to diameter ratio and same diametral clearance to diameter ratio.

Fig. 4—Sectional view of high temperature ball bearing grease testers which subject the four bearing set to both radial and axial loads



4

1948

Iron and Steel Exposition

To Feature Many Postwar Developments

Advancements, still in the formative stage during the 1946 show, will be revealed for the first time by many of the 130 exhibitors collaborating in the Cleveland exposition, Sept. 28 to Oct. 1

EXPECTED to be one of the most important and informative meetings in the history of the iron and steel industry, the Iron & Steel Exposition and annual meeting of the Association of Iron & Steel Engineers will be held in Cleveland, September 28 through October 1.

Many postwar advancements, which were not sufficiently developed at the last exposition in 1946, have now been translated into practice and will be described for the first time. One outstanding development to be pointed up at the meeting is the new Jones & Laughlin tandem cold strip mill, with only a very brief history of less than a year's operation. This mill has come to be known as the "fastest cold-rolling mill in the world". Design and operating method of this mill, which rolls over 6200 feet of tin plate per minute, will be revealed in detail. Another equally interesting development to be presented formally for the first time is the startling low coke rate achieved at the new blast furnace of the Kaiser Steel plan, Fontana, Calif. Only a few times during the past 18 months has the coke rate at Fontana exceeded 1450 pounds per ton of iron. This rate is not only low for California with a production of which metallurgical coke has always been a problem, but it is low for other sections of the country as well.

Other subjects to be covered will concern the improved, redesigned bearing seals which are a direct outgrowth of today's increased working pressures and the development of hydraulic devices throughout the industry. Water works maintenance within the steel industry, fuel oil supply, natural gas reserves, and a newly designed, mandrel type hot strip mill will be covered by other authors during the technical session of the meeting. A small model crane, operated by a full size dynamic lowering hoist control panel and a 6-point master switch will be one of the many new equipment items to be displayed at the exposition. Details of design and operation of a new type flying shear drive will be set forth in a talk to be given by J. Raymond Erbe of Westinghouse Corp. He will discuss the performance, to date, of the drive recently installed in a continuous hot strip mill, and will give comparative data of its performance, and that of previous designs. Conditions which prompted the design of the new shear drive will be presented at this same meeting. Joseph G. Surchek will discuss the petroleum base, nondrying protective coatings which are now being applied to steel structures.

A symposium on "Stresses in Hot Metal Ladles" will highlight the standardization session. Participating in the discussion will be K. E. Knudsen, W. H. Munse and B. G. Johnson who will report findings of experimental tests utilizing one-fifth scale models of three hot metal ladles.

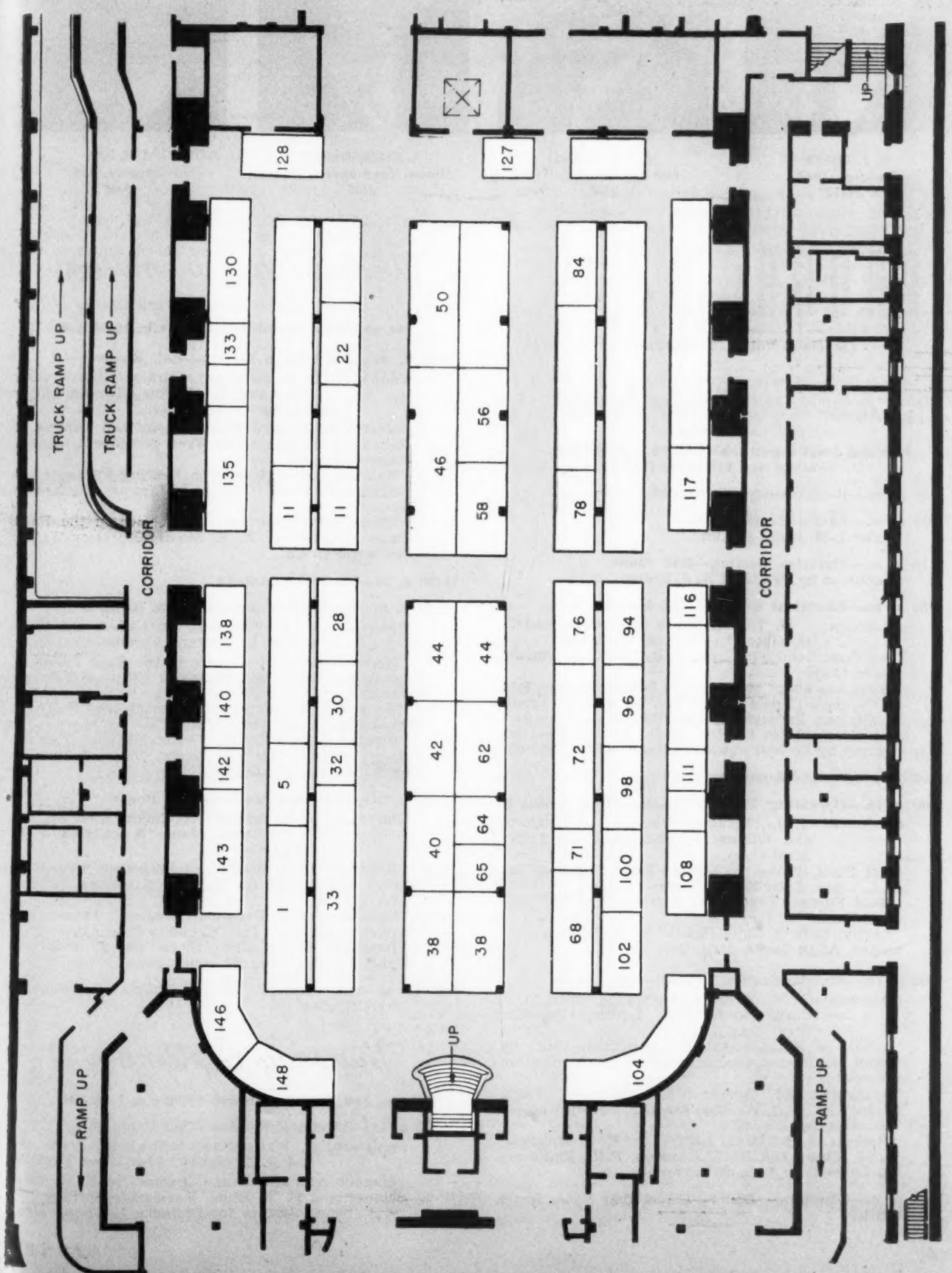
The exposition, to be held in Cleveland Public Auditorium is to have more than 250 exhibit booths sponsored by 134 companies who will display their new equipment and processes on the two floors of the auditorium. An attendance of 12,000 or more steel plant officials, suppliers and others is expected. President A. J. Fisher of the AISE has issued an invitation for not just the engineering personnel but everybody connected with the steel industry to attend these meetings. Four full days will be devoted to technical meetings where more than 40 papers and discussions will be presented.

A map of the auditorium floor layout is shown on pages 98 and 99 and list of the companies exhibiting begins on page 101, and is keyed to the map by booth numbers.

The 1948 officers of the Association of Iron & Steel Engineers: President, A. J. Fisher, assistant chief engineer of construction, Bethlehem Steel Co.; First Vice President, C. H. William, chief engineer, Carnegie-Illinois Steel Corp.; Second Vice President, Albert S. Glossbrenner, assistant vice president of operations, Youngstown Sheet & Tube Co.; Secretary, I. N. Tull, electrical superintendent of Cleveland district, Republic Steel Corp.; and John F. Black, general superintendent, Buffalo plant, Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp.

Exposition Floor Plan

Cleveland Public Auditorium, East Sixth street and Lakeside avenue. Exposition hours: Tuesday, September 28—10:00 a.m. to 10:00 p.m.; Wednesday, September 29—10:00 a.m. to 10:00 p.m.; Thursday, September 30—10:00 a.m. to 5:30 p.m.; Friday, October 1—10:00 a.m. to 4:00 p.m.



A. J. FISHER
President, 1948
AISE

C. H. WILLIAMS
First Vice President, 1948
AISE

A. GLOSSBRENNER
Second Vice President, 1948
AISE

I. N. TULL
Secretary, 1948
AISE

PROGRAM

Cleveland Public Auditorium

Tuesday, September 28

Iron and Steel Exposition—10:00 a.m.-10:00 p.m.
—Arena and Exhibition Hall

9:00 a. m.—Registration—Main Lobby

9:00 a. m.—Ladies Registration—
Parlor L-M, Hotel Statler

9:15 a. m.—Business Meeting—Ball Room
Conducted by President A. J. Fisher

9:30 a. m.—Electrical Session—Ball Room
Chairmen: I. N. Tull, Republic Steel Corp. and J. D. O'Roark, Weirton Steel Co.
"Air Conditioning of Crane Cabs" by R. D. Darrah, Dravo Corp.
"Some Results of Mercury Arc Rectifier Operations in Carnegie-Illinois Steel Corp. Plants" by Frank W. Cramer, Carnegie-Illinois Steel Corp.
"Developments in Electric Cables for the Steel Industry" by E. W. Davis, Simplex Wire & Cable Co.

12:00 Noon—Ladies' Luncheon

2:00 p. m.—Operating Practice Session—Club Room B
Chairmen: J. L. Tatman, Wheeling Steel Corp. and William H. Collison, Great Lakes Steel Corp.
"Hot Blast Stoves for Modern Blast Furnaces" by R. L. Clark, John Mohr & Sons
"Blast Furnace Practice at Fontana" by C. H. Lenhart, Kaiser Co. Inc.
"Special Cars in Steel Plants" by E. W. Schellentrager, Atlas Car & Mfg. Co.

2:00 p. m.—Standardization Session—Ball Room
Chairmen: F. W. Cramer, Carnegie-Illinois Steel Corp. and Leonard Larson, Republic Steel Corp.
"Report of Standardization Committee—1948" by Frank W. Cramer, Chairman AISE Standardization Committee
"Analytical and Experimental Studies of Ladle Hooks" by Carl W. Muhlenbruch, Northwestern Technological Institute
"Stresses in Hot-Metal Ladles" by K. E. Knudsen, W. H. Munse and B. G. Johnston, Fritz Engineering Laboratory, Lehigh University

10:00 p. m.—Exhibitors Dance—Euclid Ball Room Hotel Statler

Wednesday, September 29

Iron and Steel Exposition—10:00 a.m.-10:00 p.m.

9:00 a. m.—Combustion Session—Ball Room
Chairmen: B. B. Bargman, Carnegie-Illinois Steel Corp. and E. C. Hite, Timken Roller Bearing Co.
"Steel Temperature Measurement and Control of Reheating Furnaces" by Fred S. Bloom, Bloom Engineering Co. Inc.
"Maintenance of Hearths in Heating Furnaces and Soaking Pits" by Charles N. Stewart, Bethlehem Steel Co.
"Effect of Oxygen on Refractories in the Basic Open Hearth" by R. S. Moore, Harbison-Walker Refractories Co.

11:30 a. m.—Ladies' Luncheon

2:00 p. m.—Mechanical Session—Club Room B
Chairmen: F. S. Eckhardt, Bethlehem Steel Co. and P. L. Walter, Republic Steel Corp.
"Mechanical Insert Repairs in the Steel Industry" by R. L. Rectenwald, Metalock Corp. of Pennsylvania
"Water Works Maintenance" by George H. Dann, Philadelphia Suburban Water Co.
"What the Machine Tool Industry Wants from the Steel Industry" by Tell Berna, National Machine Tool Builders' Association

2:00 p. m.—Electrical Session—Ball Room
Chairman: V. E. Schlossberg, Inland Steel Co. and D. C. Nelson, Jones & Laughlin Steel Corp.
"Electrical Equipment for Rolling Cold Strip at 70 Miles Per Hour" by William E. Miller, General Electric Co.
"Review of D-C Drives on Runout Tables and Coilers", by I. N. Tull, Republic Steel Corp.
"Improved Flying Shear Drive" by J. Raymond Erbe, Westinghouse Electric Corp.

6:00 p. m.—Old Timers' Dinner—Euclid Ball Room, Hotel Statler

Thursday, September 30

Iron and Steel Exposition—10:00 a.m.-5:30 p.m.

9:00 a. m.—Electrical Session—Ball Room
Chairmen: R. W. Graham, Bethlehem Steel Co. and A. D. Howry, Alan Wood Steel Co.
"Magnetorque A-C Crane Control" by F. W. Wendelburg and F. M. Blum, Harnischfeger Corp.
"A Network System for Dynamic Lowering Hoist

Control" by D. L. Pettit, Square D Co.
"Designing the Proper Equipment for Extracting Ingots from their Molds" by H. W. Ball, Morgan Engineering Co.

9:00 a. m.—Combustion Session—Club Room B

Chairmen: H. S. Hall, Lukens Steel Co. and C. E. Duffy, Bethlehem Steel Co.

"Training Instrument Mechanics at Sparrows Point" by F. R. Pullen, Sparrows Point Plant, Bethlehem Steel Co.
"Fuel Oil in the Steel Industry" by A. J. Fisher, Bethlehem Steel Co.
"Liquefied Petroleum Gases for the Steel Industry" by Francis E. Drake, Pacific Gas Corp.

2:00 p. m.—Lubrication Session—Club Room B

Chairmen: D. N. Evans, Inland Steel Co. and R. A. Barta, Republic Steel Corp.

"High Temperature Lubricants and their Evaluation" by G. L. Sumner, Westinghouse Electric Corp.
"Centrifugal Clarification of Oil in Steel Plants" by Charles M. Ambler, The Sharples Corp.
"Bearing Seals" by R. A. Kraus, Republic Steel Corp.

2:00 p. m.—Rolling Mill Session—Ball Room

Chairmen: C. W. Barrett, Republic Steel Corp. and J. N. Imel, Jones & Laughlin Steel Corp.

"Analysis of Cold Mill Design" by Frank P. Dahlstrom, Arms-Franklin Corp.
"Beam and Channel Roll Design" by Ross E. Beynon, Carnegie-Illinois Steel Corp.
"The Fundamentals of Hot Rolling" by George S. Mican, Carnegie-Illinois Steel Corp.

7:30 p. m.—Formal Dinner-Dance, Grand Ball Room, Hotel Statler

Speaker: J. E. Goble, President, National Tube Co.

Friday, October 1

Iron and Steel Exposition—10:00 a.m.-4:00 p.m.

9:00 a. m.—Material Handling Session—Ball Room

Chairmen: H. W. Neblett, Inland Steel Co. and A. G. Ericson, Carnegie-Illinois Steel Corp.

"Coal Preparation for Steel Manufacturers" by N. L. Davis, Nelson L. Davis Co.

Problems in Handling Heavy Coils-Symposium
Cranes: R. G. Birkin, Cleveland Crane & Engineering Co.
Trucks: C. F. Kells, The Electric Industrial Truck Association
Conveyors: J M. McBride, Palmer-Bee Co.

2:00 p. m.—Lubrication Session—Club Room B

Chairmen: C. E. Pritchard, Republic Steel Corp. and A. E. Cichelli, Bethlehem Steel Co.

"Developments in Sleeve Bearings" by A. B. Willi, Jr., Federal Mogul Corp.
"Preventive Maintenance of Electric Oils" by C. J. Egger, Bowser Inc.
"The Use of Rust Preventives in the Maintenance of Steel Structures" by Joseph G. Surchek, Dearborn Chemical Co.

2:00 p.m.—Operating Practice Session—Ball Room

Chairmen: C. L. McGranahan, Jones & Laughlin Steel Corp. and J. S. Stanier, Youngstown Sheet & Tube Co.

"Developments in Butt Weld Tube Mills" by W. Rodder, Aetna-Standard Engineering Co.
"Strip Welding" by F. R. Thompson and F. J. Waldschutz, Mesta Machine Co. "Mandrel Type Hot Strip Coiler" by G. E. Farrington, E. W. Bliss Co.

EXHIBITORS

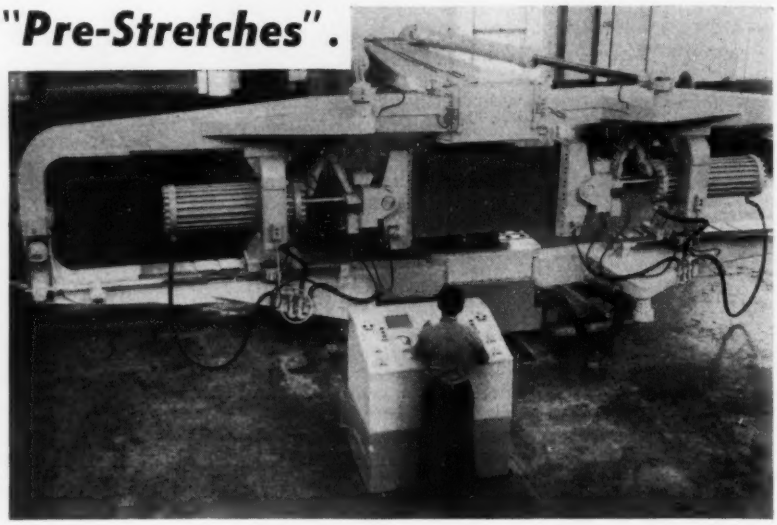
The Iron and Steel Exposition is being held in Cleveland Public Auditorium, East Sixth street and Lakeside avenue. Booths may be located by referring to the numbers on auditorium floor plan on pages 98-99.

Name	Booth No.
Ajax Flexible Coupling Co., Inc., Westfield, N. Y.	94
Allen Bradley Co., Milwaukee, Wis.	308
Allis-Chalmers Mfg. Co., Milwaukee, Wis.	33
Aluminum Co. of America, Pittsburgh, Pa.	207
American Brake Shoe Co., New York, N. Y.	294
American Hoist & Derrick Co., St. Paul, Minn.	284
Amsler Morton Corp., Pittsburgh, Pa.	317
Appleton Electric Co., Chicago, Ill.	300
Askania Regulator Co., Chicago, Ill.	242
Automatic Transportation Co., Chicago, Ill.	38
Baker-Raulang Co., Cleveland, O.	361
Bantam Bearings Division, Torrington Co., Torrington, Conn.	318
Bearing Service Co., Pittsburgh	320
Benjamin Electric Mfg. Co., Des Plaines, Ill.	128
Biddle Co., James G., Philadelphia, Pa.	231
Blaw-Knox Co., Blawnox, Pa.	276
Bloom Engineering Co., Pittsburgh, Pa.	348
Brosius Co., Edgar E., Pittsburgh, Pa.	22
Bull Dog Electric Products Co., Detroit, Mich.	130
Burndy Engineering Co. Inc., New York, N. Y.	138
Carbone Corp., Boonton, N. J.	273
Chicago Rawhide Mfg. Co., Chicago, Ill.	232
Clark Controller Co., Cleveland, O.	68
Cleveland Crane & Engrg. Co., Wickliffe, O.	255
Cleveland Worm & Gear Co., Cleveland, O	244
Clipper Mfg. Co., Kansas City, Mo.	219
Crocker-Wheelers Division, Joshua Hendy Iron Works, Ampere, N. J.	271
Crouse-Hinds Co., Syracuse, N. Y.	340
Cutler-Hammer Inc., Milwaukee, Wis.	46
De Laval Separator Co., New York, N.Y.	344
Delta-Star Electric Co., Chicago, Ill.	216
Dixon Crucible Co., Joseph, Jersey City, N. J.	111
Dowell Inc., Tulsa, Oklahoma	324
Dravo Corp., Pittsburgh, Pa.	274
Eastern Pipe Maintenance Co., Pittsburgh, Pa.	218
Edison Inc., Thomas A., West Orange, N. J.	224
Electric Controller & Mfg. Co., Cleveland, O.	135
Electric Products Co., Cleveland, O.	30
Electric Storage Battery Co., Philadelphia, Pa.	326
Electro Chemical Process Division, Blaw-Knox Co., Pittsburgh, Pa.	276
Elwell-Parker Electric Co., Cleveland, O.	148
Euclid Crane & Hoist Co., Euclid, O.	127
Factory Stores Co., Cleveland, O.	336
Farmers Engineering & Mfg. Co., Pittsburgh, Pa.	335
Farval Corp., Cleveland, O.	244
Federal Electric Products Co., Inc., Newark, N. J.	78
Fenn College, Cleveland, O.	96
The FOUNDRY	331
Fulton Foundry & Machine Co. Inc., Cleveland, O.	65
Furnace Engineers Inc., Pittsburgh, Pa.	330
Garlock Packing Co., Palmyra, N. Y.	311
General Electric Co., Schenectady, N. Y.	278
Gordon Lubricators Division, Blaw-Knox Co., Pittsburgh, Pa.	276
Gould Storage Battery Corp., Trenton, N. J.	352
Hagan Corp., Pittsburgh, Pa.	146
Heil Process Equipment Corp., Cleveland, O.	310
Heppenstall Co., Pittsburgh, Pa.	62
Hodson Corp., Chicago, Ill.	223
Holophane Co. Inc., New York, N. Y.	116
Homestead Valve Mfg. Co. Inc., Coraopolis, Pa.	264
Houghton, E. F. & Co., Philadelphia, Pa.	102
Hunt & Son Inc., C. B., Salem, O.	350
Hyatt Bearings Division, General Motors Corp., Harrison, N. J.	286

EXHIBITORS

Name	Booth No.
Industrial Heating	142
Iron Age	345
I-T-E Circuit Breaker Co., Philadelphia, Pa.	315
Kennametal Inc., Latrobe, Pa.	143
Keystone Lubricating Co., Philadelphia, Pa.	268
Koppers Co. Inc., Pittsburgh, Pa.	305
Lewis Foundry & Machine Division, Blaw-Knox Co., Pittsburgh, Pa.	276
Lincoln Engineering Co., St. Louis, Mo.	261
Linde Air Products Co., New York, N. Y.	355
Link-Belt Co., Philadelphia, Pa.	1
Lintern Corp., Berea, O.	254
Lovejoy Flexible Coupling Co., Chicago, Ill.	247
Lubriplate Division, Fiske-Brothers Refining Co., Newark, N. J.	349
MACHINE DESIGN	331
McCaskey Register Co., Alliance, O.	133
Martindale Electric Co., Cleveland, O.	32
Mesta Machine Co., West Homestead, Pa.	288
Metalock Casting Repair Service, Long Island City, N. Y.	223
Morganite Inc., Long Is. City, N. Y.	210
National Alloy Steel Division, Blaw-Knox Co., Blawnox, Pa.	276
National Carbon Co. Inc., New York, New York	355
National Electric Coil Co., Bluefield, W. Va.	84
National Safety Council	5
Ohio Carbon Co., Cleveland, O.	71
Ohio Electric Mfg. Co., Cleveland, O.	56
Okonite Co., Passaic, N. J.	221
Otis Elevator Co., New York, N. Y.	234
O-Z Electrical Mfg. Co., Brooklyn, N. Y.	117
Pannier Corp., Pittsburgh, Pa.	252
Penton Publishing Co.	331
Pittsburgh Rolls Division, Blaw-Knox Co., Pittsburgh, Pa.	276
Post-Glover Electric Co., Cincinnati, O.	76
Powermatic Ventilator Co., Cleveland, O.	58
Power Piping Division, Blaw-Knox Co., Pittsburgh, Pa.	276
Pyle-National Co., Chicago, Ill.	98
Railway Industrial Engrg. Co., Greensburg, Pa.	314
Ramtite Co., Chicago, Ill.	328
Ready-Power Co., Detroit, Mich.	140
Reliance Electric & Engrg. Co., Cleveland, O.	44
Rockbestos Products Corp., New Haven, Conn.	235
Roller-Smith Division, Realty & Industrial Corp., Bethlehem, Pa.	50
Rollway Bearing Co. Inc., Syracuse, N.Y.	205
Rust-Oleum Corp., Evanston, Ill.	64
Salem Engineering Co., Salem, O.	230
Shell Oil Co., New York, N. Y.	353
Signode Steel Strapping Co., Chicago, Ill.	100
SKF Industries Inc., No. Philadelphia, Pa.	259
Socony-Vacuum Oil Co., New York, N.Y.	266
Speer Carbon Co., St. Mary's, Pa.	270
Square D Co., Milwaukee, Wis.	72
STEEL	331
Stewart-Warner Corp., Chicago, Ill.	250
Sutton Engineering Co., Bellefonte, Pa.	42
Texas Co., New York, N. Y.	342
Thomas & Betts Co., Elizabeth, N. J.	322
Thompson Electric Co., Cleveland, O.	40
Tide Water Associated Oil Co., New York, N. Y.	108
Timken Roller Bearing Co., Canton, Ohio	104
Tool Steel Gear & Pinion Co., Cincinnati, O.	240
Towmotor Corp., Cleveland, O.	11
Trabon Engineering Corp., Cleveland, O.	28
Trumbull Electric Mfg. Co., Plainville, Conn.	248
Union Carbide & Carbon Corp., New York, N. Y.	355
Union Steel Castings Division, Blaw-Knox Co., Pittsburgh, Pa.	276
United American Metals Corp., Brooklyn, N. Y.	263
Wagner Electric Corp., St. Louis, Mo.	256
Waldron Corp., John, New Brunswick, N. J.	292
Wellman Engineering Co., Cleveland, O.	233
Westinghouse Electric Corp., Pittsburgh, Pa.	201
Wing Mfg. Co., L. J., New York, N. Y.	347
Yale & Towne Mfg. Co., Philadelphia, Pa.	211

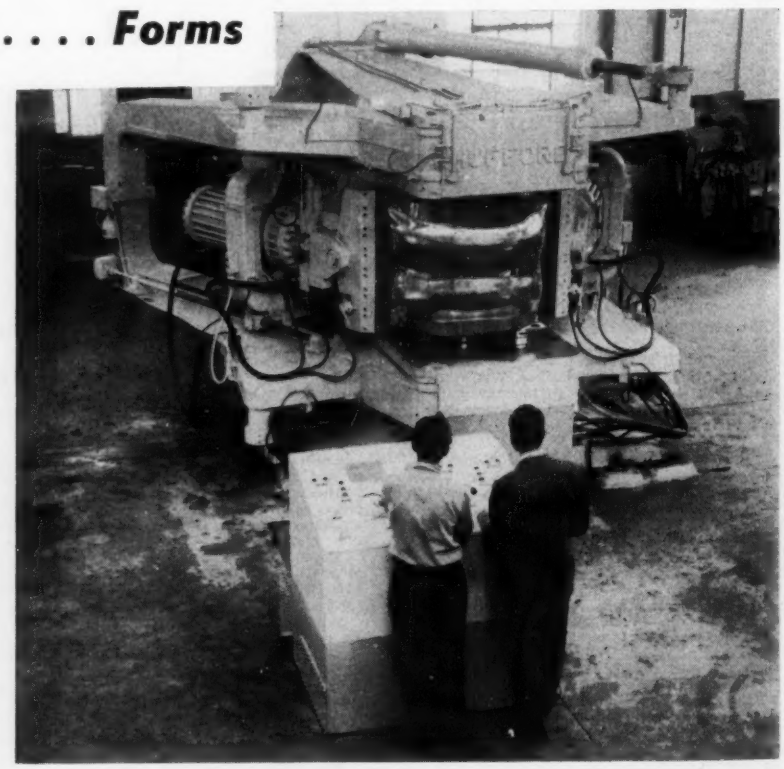
"Pre-Stretches" . . . .



Jaws of this newly developed machine, each capable of exerting a 50-ton pull are in "relaxed" position preparatory to stretching aluminum alloy sheet. Built specially by Hufford Co., Redondo Beach, Calif., for use in the plant of American Aviation Inc., Los Angeles, the unit "pre-stretches" each sheet before pulling it over the die, contrary to former process of stretching similar stock while it is being formed in a die . . .

. . . Pulling the alloy sheet over the die results in formed part of closer limits, more uniform strength, "spring-back" being reduced to minimum. Stretcher also is adaptable to many jobs previously done by drophammers and other stretching and forming machines. Similar machine for bending-forming extrusions up to 4 square inches cross section applies 130-ton bend. It can bend an extrusion beyond 180 degrees

. . . . Forms



New Commercial Tonnage Oxygen System

. . . eliminates dangerous hydrocarbons and resultant acetylene explosions

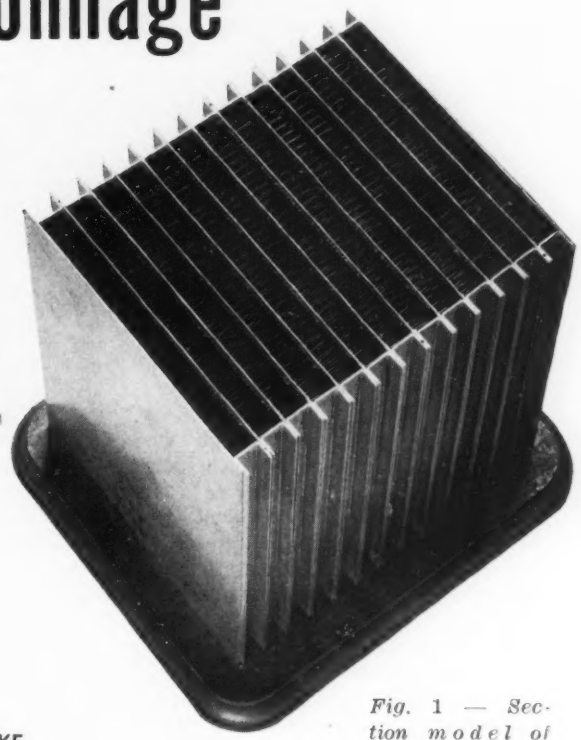


Fig. 1 — Section model of gas-to-gas heat exchanger

Design of suitable heat exchangers was imperative if tonnage oxygen plants were to become a reality. This was the subject of intensive engineering development and has resulted in a heat exchanger which can be built in standardized sections at moderate cost

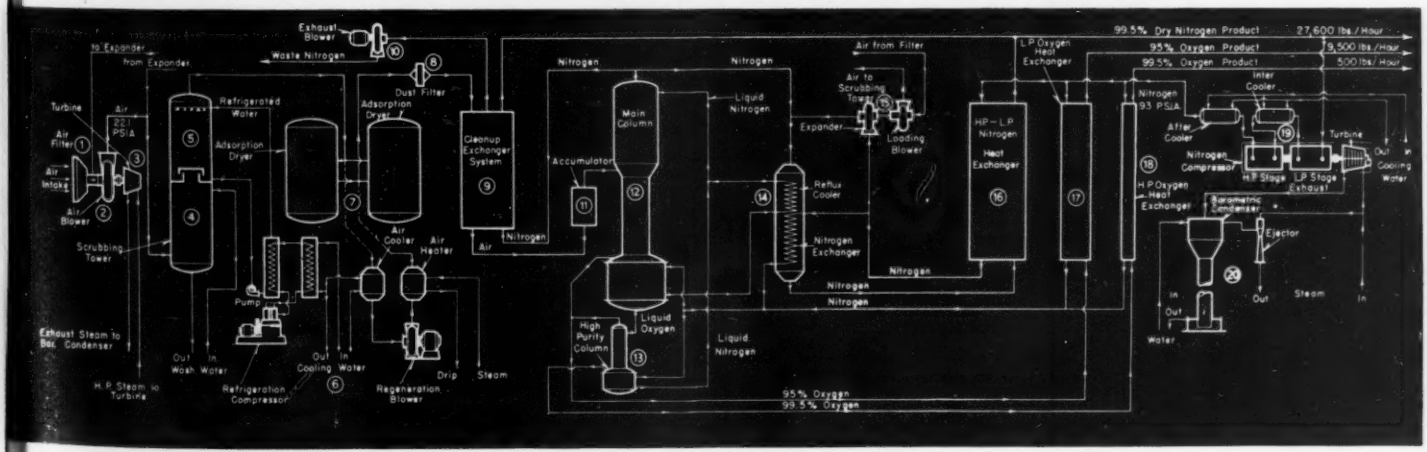
By B. H. VAN DYKE
Mgr., New Products Dept.
Elliott Co.
Jeannette, Pa.

CYCLE of the tonnage oxygen set-up recently unveiled by Elliott Co., Jeannette, Pa., utilizes an atmospheric pressure air distillation system, combined with a nitrogen liquefaction and refrigeration system in such a manner as to provide a unique combination of features and an unusual degree of safety and flexibility in operation.

The following features of the system are further described in this article; plant is not subjected to the necessity of periodic shutdowns for deriming; system is completely immune to possible dangers of acetylene explosions; plant operates at reduced loads without sacrifice of efficiency; set-up is mechanically simplified; all controls are automatic; recovery of oxygen from the air charged to the system is over 97 per cent and nitrogen leaving the process is over 99.5 per cent pure; oxygen of any purity can be made, and a plant designed for 95 per cent purity can also simultaneously produce 99.5 per cent welding grade oxygen in quantities as required.

Simplified flow diagram, Fig. 2, is for a plant designed to produce approximately 114 tons daily of 95 per cent purity gaseous oxygen, plus approximately 6 tons per day of 99.5 per cent high-purity gaseous oxygen, plus 332 tons per day of 99.5 per cent purity dry nitrogen. Recovery of oxygen from the air charged to the plant is approximately 97.5 per cent. The nitrogen product may be used for chemical synthesis without further purification. If a nitrogen product of higher purity is desired, it may also be obtained. The supplemental high purity oxygen product is made without increasing the horsepower per total unit of oxygen produced by the plant. This has the effect, in many instances, of making it possible

Fig. 2—Simplified flow diagram of tonnage oxygen plant



for the user to obtain his full requirement of high-purity oxygen at the same cost per ton as the low-purity oxygen.

Starting at the left-hand side of the diagram, outside air enters through filter (1) and is compressed in a single-stage centrifugal blower (2) to a pressure only sufficiently above atmospheric to overcome friction loss in the equipment. In the diagram this pressure is shown as 22.1 pounds per square inch average. This pressure may be increased or decreased as an economic balance against pressure drop, which in turn is related to capital cost of the plant. This blower may be turbine or electric motor driven; greater flexibility may be obtained with turbine drive. A portion of the incoming air is compressed to the same pressure through the expander blowers (15), which parallel the air charging blower (2). This discharge from the expander blower joins with the discharge from the air-charging blower and flows into the bottom of a double scrubbing tower (4).

Air is dehumidified and freed of dust before entering the clean-up heat exchangers. This is accomplished by the use of a scrubbing tower in two stages (4) and (5). In section (4), river or other circulating water is used. In section (5) recirculating refrigerated water is employed so that the air leaving the top of the scrubbing tower will be at approximately plus 40° F, dust-free and saturated with water vapor. Power required for the refrigeration system (6) is a small item charged against the total power for the production of oxygen.

The air is next further dehumidified by passing through an absorption drier (7). This is a conventional system using activated alumina or similar desiccant and is provided in duplicate for regeneration. The air leaving the drier will be at a temperature of approximately plus 70° F, and a dewpoint of minus 40° F. A dust filter (8) is provided to remove traces of dust which might break loose from the drier during the early stages of operation.

In the clean-up heat exchanger system (9), air is cooled to a temperature of approximately minus 310° F. Nitrogen from the top of the column (12) is used as the cooling medium and enters the heat exchangers at approximately minus 318° F. In the process of cooling, water vapor, carbon dioxide, and other impurities contained in the air will be frozen out on the heat exchanger surface, which eventually will plug the passages unless some provision is made for cleaning.

Nitrogen leaving the warm end of the clean-up heat exchanger will be at a temperature approximately 8 to 10 degrees lower than the entering air. This nitrogen is bone dry and is used in quantity as required to regenerate or remove deposited impurities from the heat exchanger. The system is arranged so that through a combination of automatic valves on a fixed time cycle one heat exchanger bank at a time is switched from service and purged of deposited impurities. Experimental operation of the pilot plant indicates that approximately 10 per cent of the effluent nitrogen is required for this purpose. Since the flow of nitrogen through the heat exchanger being cleaned will be in series with the flow of nitrogen leaving the heat exchanger in service, it is necessary to provide sufficient pressure from the charging blower (2) to overcome this additional head. Rather than supply this horsepower to 100 per cent of the air charged, it has been found more economical to install a small exhaust blower (10) to suck the small amount of nitrogen which is required for the clean-up operation through the exchanger being cleaned. The nitrogen discharging from this blower will then carry to waste all of the impurities previously deposited from the air.

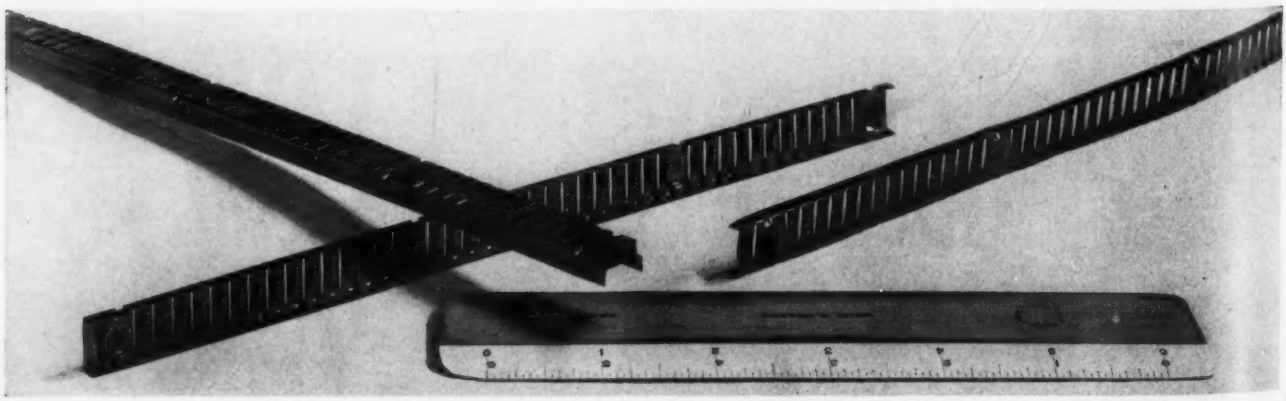
The exchangers are automatically switched out of service for purging every four hours. By reducing the dewpoint of the air to minus 40° F before entering clean-up heat exchanger system the time for clean-up of the exchange with respect to water vapor is brought into balance with the time for carbon dioxide. No economic benefit will result from further reduction of the dewpoint of the entering air.

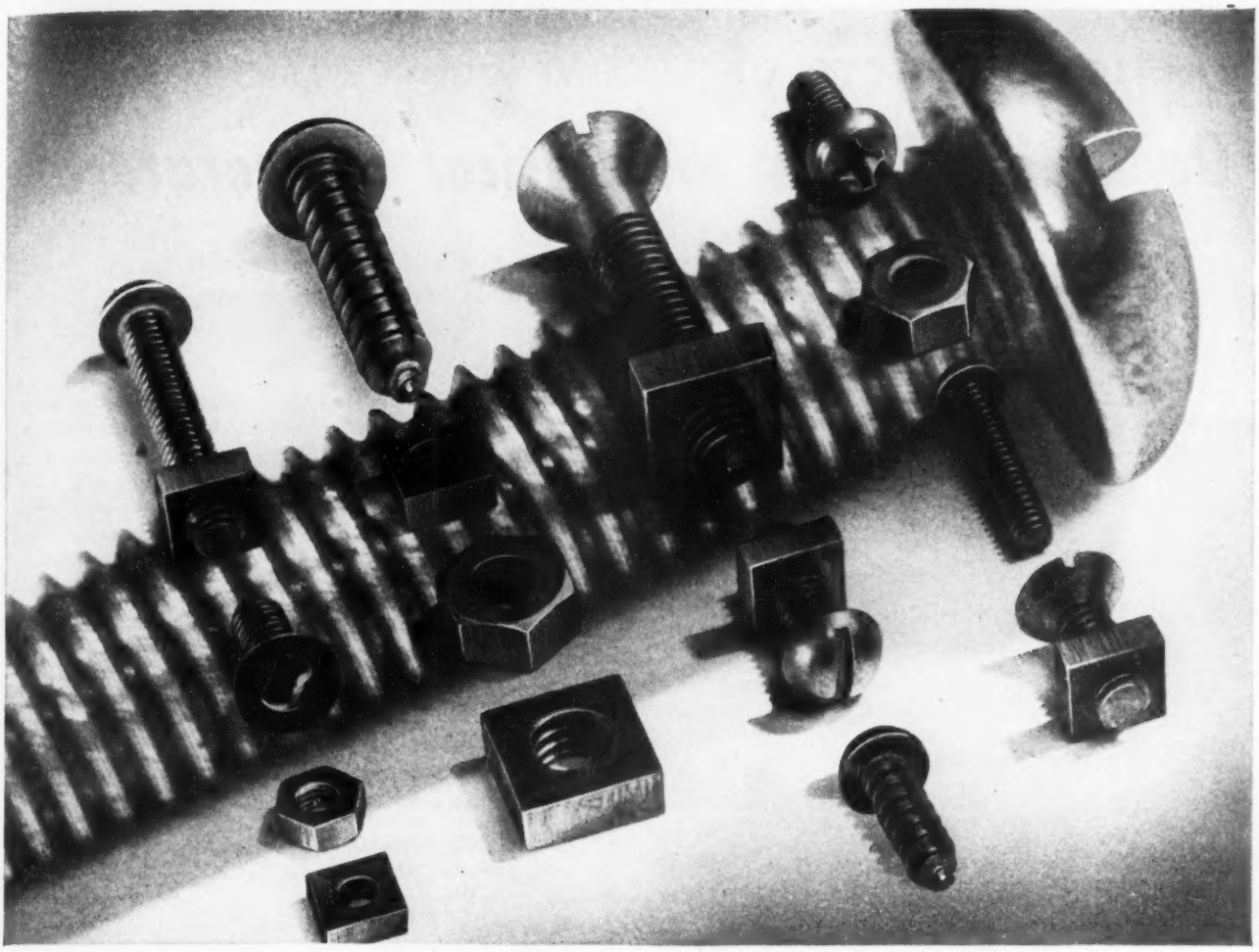
By accepted concepts of heat transfer, such as would be obtained with conventional shell and bare tube surface, over 100,000 square feet would be required to perform the air-to-nitrogen exchange. Such a heat exchanger would not be practical. Cost would be prohibitive, amount of metal to be cooled before the process could operate would be tremendous, and the exposed cold surface which would have to be insulated would be so large that it would not be possible to provide sufficient refrigeration to make the plant operable. From this, it can be readily seen that the design of suitable heat exchangers is imperative if a low cost tonnage oxygen plant is ever to become a reality. This has been the subject of intensive engineering development and has resulted in a heat exchanger surface which can be built in standardized sections at moderate cost. The heat exchanger lends itself to mass production techniques and the same standardized sections may be used for any plant regardless of capacity. This minimizes the replacement problem and lowers the plant investment. The heat exchanger consists essentially of thin copper fins furnace bonded between brass plates. The exchanger is manifolded so that one fluid will flow in one direction through every alternate passage and the other fluid will flow in the opposite direction through the intermediate passages. This arrangement of surface provides over 300 square feet of effective surface per cubic foot of heat exchanger volume and corresponds to over 3.5 square feet per pound of metal.

The fact that air leaving the clean-

(*Please turn to Page* 134)

Fig. 3—Fin stampings for gas-to-gas heat exchanger





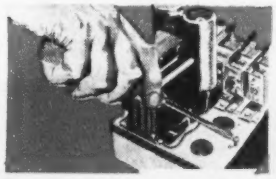
IT'S "t.f.e."

TO CUT THE MAJOR COSTS OF FASTENING

The *major* costs are time and labor. A *minor* cost is initial price.

When you give a man a fastener he can handle with confidence and ease . . . because the dimensions are accurate and uniform, the threads sharp and clean, the heads strong . . . you are saving money. Far more money than you could save through a lower price.

Each time your worker picks up an RB&W bolt, nut, screw or rivet . . . you benefit, cost-wise, from RB&W's know-how, acquired through 103 years of pioneering . . . and from the tremendous investments RB&W has made in modern plants, modern machinery, modern quality control practices.



WORKERS LIKE dependable fasteners headed, threaded and finished to RB&W's quality standards which insure accurate, uniform dimensions; clean, smooth surfaces.

ASSEMBLY SPEED depends on fastener accuracy, obtainable only by controlling raw material. RB&W draws its own wire, using tungsten carbide dies for closest tolerances.

QUALITY CONTROL, with RB&W, is built around proper preparation of materials and equipment. Our constant check, plus conscientious inspection, reduces your inspection.

t.f.e.

TRUE FASTENER ECONOMY
IS THE LOWEST TOTAL OF ALL
FASTENING COSTS

•

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

BOLTS NUTS SCREWS RIVETS
RB&W
THE COMPLETE QUALITY LINE
& ALLIED FASTENING PRODUCTS

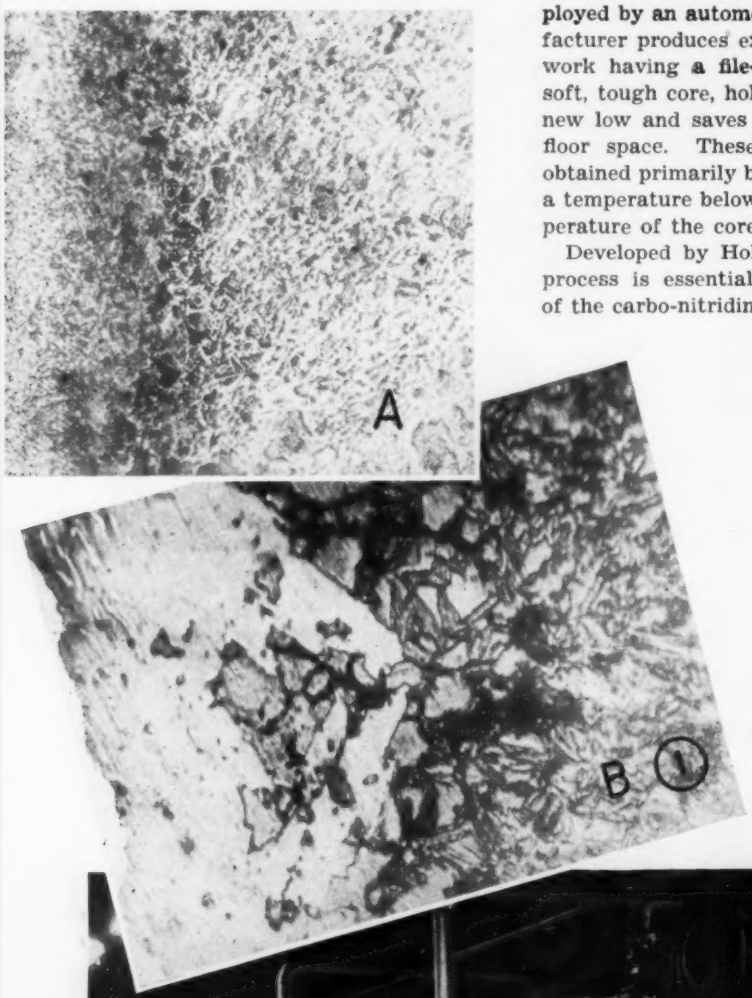
Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

103 Years Making Strong the Things That Make America Strong

PRACTICAL ASPECTS OF

Quenching Below the Critical Temperature

Automotive parts manufacturer reaps economic and metallurgical benefits with new case-hardening technique, a modification of the carbo-nitriding process



NEW case-hardening technique employed by an automotive parts manufacturer produces exceptionally clean work having a file-hard case and a soft, tough core, holds distortion to a new low and saves time, money and floor space. These advantages are obtained primarily by quenching from a temperature below the critical temperature of the core.

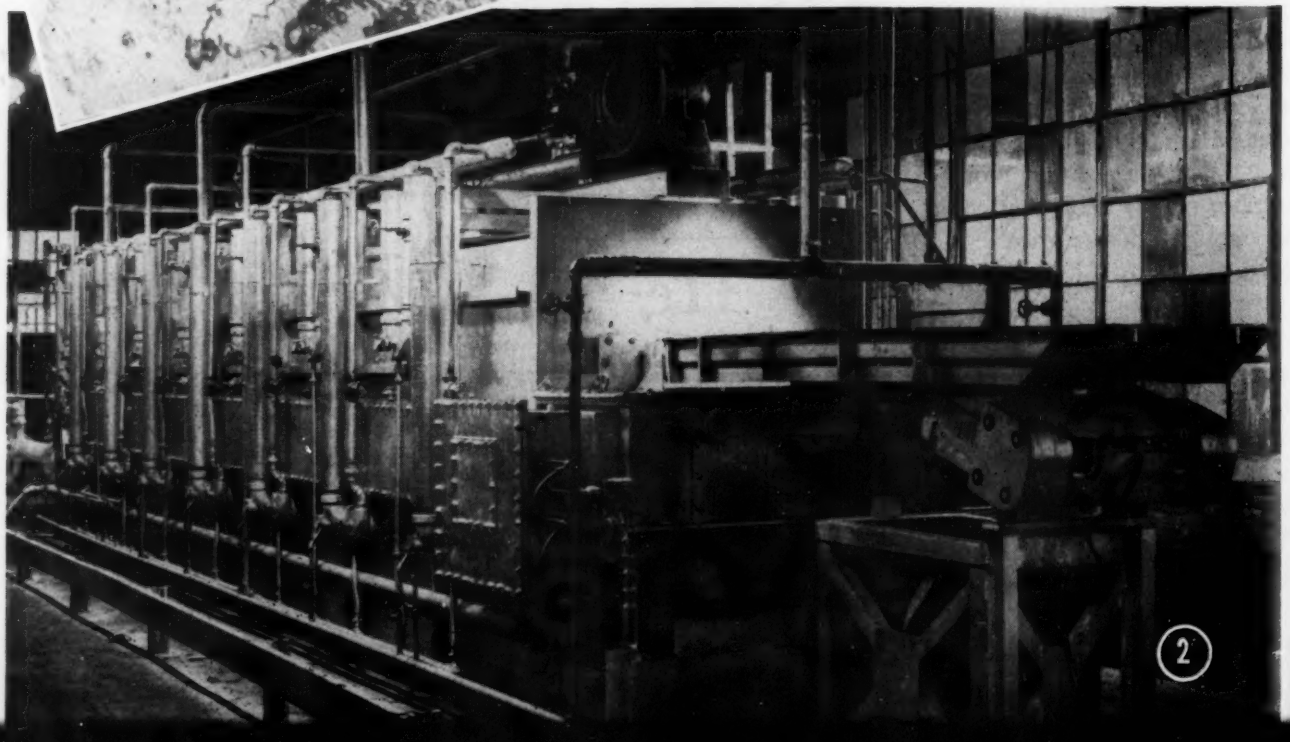
Developed by Holcroft & Co., this process is essentially a modification of the carbo-nitriding process, wherein the parts (plain carbon or alloy steel) are heated in a controlled atmosphere composed of generator gas, hydrocarbon gas and ammonia. Besides increasing the wear resistance as compared to straight carburizing, addition of nitrogen from the ammonia depresses the critical quenching temperature of the case several hundred degrees below that of the original steel.

Cooled Before Quenching — Before quenching, the work is cooled to a

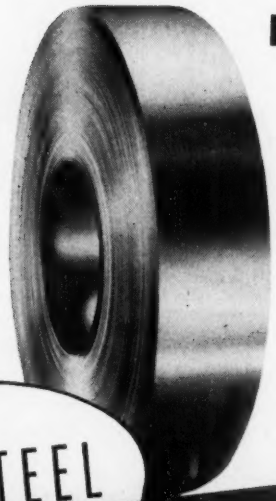
By WALTER H. HOLCROFT
Vice President and Technical Director
and
HAROLD J. HAMMOND
Metallurgical Engineer
Holcroft & Co.
Detroit

Fig. 1—Photomicrographs at 100X (A) and 750X (B) of a typical steel part carbo-nitrided at 1550° F and quenched from a temperature below the critical of the core. Case shows partially transformed austenite, while core shows ferrite and fine pearlite

Fig. 2—View of charge end of Holcroft furnace installation for carbo-nitriding and quenching below the critical temperature of the core. Operation is completely automatic from loading of furnace to discharge from the quench tank



HOW CMP THINSTEEL IMPROVES PROFIT PICTURES



Cold rolled strip steel users who work with CMP Thinsteel frequently find their over-all production costs lower than when employing competitive products.

There's good reason. Thinsteel offers characteristics that are reflected in sharp reductions in fabricating costs and product improvement that enhances sales appeal.

Check these Thinsteel features and judge for yourself how Thinsteel can help to improve your profit picture.

CMP THINSTEEL

CHARACTERISTIC	WHAT IT MEANS TO YOU
WIDE RANGE OF ANALYSES IN CARBON, ALLOY AND STAINLESS GRADES	The analysis best suited to your end product requirement can be developed and produced to meet the particular fabricating problems involved.
CLOSE GAUGE TOLERANCES	More parts per ton. An average oversize variation of .002" on .030" strip means 6⅔% fewer parts per ton.
GAUGES THIN AS .001"	Lighter gauges with properly developed physical properties can often be used to replace heavier gauges, reducing weight without sacrificing strength or utility.
FINISHES FROM DULL TO MIRROR-BRIGHT OR ELECTRO-ZINC COATED	You have your choice of regular cold rolled for ordinary purposes, mirror-bright for plating and mirror-bright stainless or electro-zinc coated carbon steel for corrosion resistance.
EXTRA-LONG COILS	Fewer shutdowns for coil replacement on coil-fed machines. Greater per-day production.

CMP STRIP STEEL — PRECISION COLD ROLLED

the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

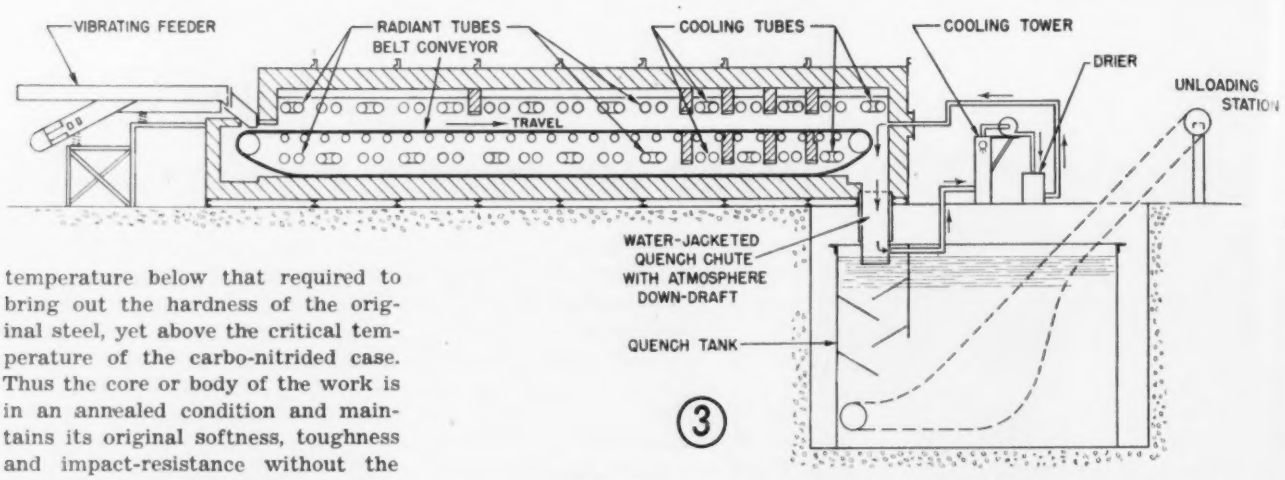


Fig. 3—Schematic vertical sectional view of installation shown in Fig. 2, showing continuous conveyor, cooling tubes, atmosphere recirculating and drying arrangement which provides down-draft in quench chute to keep water vapor out of the furnace

temperature below that required to bring out the hardness of the original steel, yet above the critical temperature of the carbo-nitrided case. Thus the core or body of the work is in an annealed condition and maintains its original softness, toughness and impact-resistance without the necessity of a drawing operation, while the case is fully quenched out to file hardness. The cooling is done in the carbo-nitriding furnace atmosphere so as to provide uniformity of temperature before quenching and eliminate all possibility of scaling or decarburizing.

As with any other heat treat process, any slight movement of the steel required to relieve stresses set up in previous mechanical operations will take place while the work is in the furnace. However, since the body of the work is slowly and uniformly cooled through its critical temperature, the work is not subjected to internal stresses caused by partly-transformed metallurgical structures. Consequently, the problem of distortion is negligible.

Temperature required for this subcritical quench is largely dependent on the analysis of the original steel. Critical temperature of the case is determined by the amount of nitrogen and carbon alloyed with the steel during the carbo-nitriding process, and is governed by the percentages of ammonia and hydrocarbon gas in the furnace atmosphere and by the furnace temperature.

A remarkably wear-resistant surface is produced by the carbo-nitriding treatment. By varying the amounts of ammonia and hydrocarbon gas in the furnace atmosphere, cases may be produced ranging from largely martensite to largely austenite, which latter may have nitrogen compounds in solution. Typical photomicrographs are shown in Fig. 1. The surface has considerable resistance to oxidation in its normal exposure in service, and this resistance is augmented by a light oil film provided by quenching in "soluble oil," which is approximately 99 per cent water.

Special Equipment Features — The furnace installation used for this subcritical quenching process, Figs. 2 and 3, incorporates special design features required for this specific application. The furnace is heated by gas-fired radiant tubes; similar tubes at the discharge end are used for cooling prior to the quench. The latter tubes may also be used for heating when a full normal quench from 1500°F or higher is desired. Change-over from one type of operation to the other is quickly accomplished by means of valves.

Work is placed in bulk on a vibrating feeder, extremely flexible in its rate of feed. The feeder deposits the work on a continuous belt conveyor which carries it through the furnace at a rate of speed that can be varied to suit the requirements for depth of case. The conveyor is carried on alloy rolls mounted on water-cooled roller bearings; and since it remains completely inside the furnace, the conveyor is hot when returned to the charge end, allowing fuel economies that are not possible with tray-type loading.

Work travels through three controlled-temperature zones, the last of which is the cooling zone where the work is cooled slowly and uniformly to the sub-critical quenching temperature. From there, the work falls directly into the quench tank, from which another conveyor carries it to the unloading station. Operation is completely automatic.

Good Quenching Conditions—With the work thus falling into the deep quench tank at a steady rate, ideal quenching conditions are obtained. The quenching medium is held at constant temperature by a battery of heat exchangers.

As the hot stock hits the quenching medium, a considerable volume of steam is formed. To keep the steam from entering the furnace, where it would upset the gas equilibrium and prevent successful carbo-nitriding, a large volume of gas is drawn out of the quench chute just above the surface of the quenching medium. Gas is cooled in a spray tower to remove most of the water vapor, is further dried with activated alumina, and is reintroduced into the furnace at the upper part of the quench chute. Thus a continuous down draft is created which is very effective in removing the steam. In addition, the quench chute is water-jacketed to reduce the formation of steam by splashes hitting the walls of the chute.

Stock is discharged with a clean steel-gray color and requires no further processing, resulting in worthwhile savings in production time, equipment investment and also in floor space.

A typical production figure for this installation is 2400 pounds per hour at 1-3/4 hours total time in the furnace. This gives a case depth of 0.008 to 0.010-inch. Where a shallower case is required, the capacity is increased accordingly by increasing the speed of both the conveyor and the feeder.

—o—

Mathematical problems often encountered in business and finance are easily solved with a new slide rule developed by Pickett & Eckel Inc., Alhambra, Calif. The scales on the front of the rule permit calculation of markup, while those on the back are for use in figuring business ratios, per cent, simple and compound interest, discounts, multiplication, division, squares and square roots, logarithms, and powers with positive exponents. Its operation is so simple no special mathematical training is needed to use it.

for faster tighter riveting . . .

Hanna

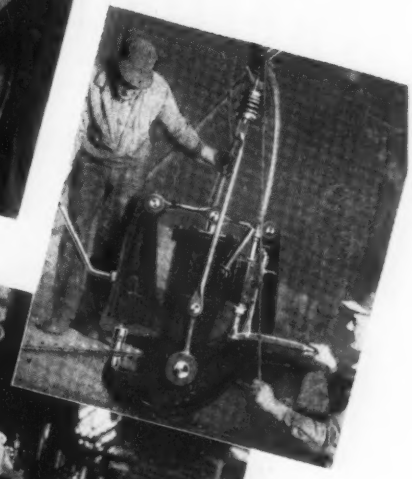
. . . pinch bug riveters

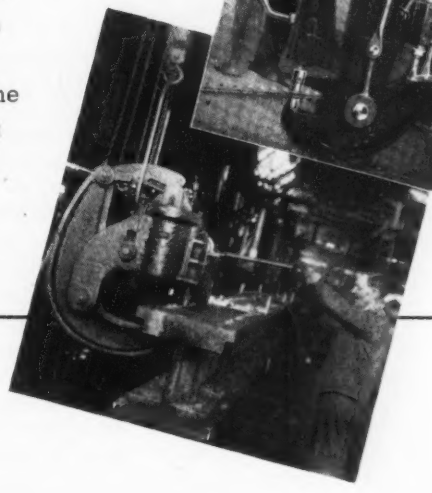
Hanna . . .

Hanna Pinch Bug Riveters, with reach of 8 inches or 9⅞ inches are ideal where rivets are located near edge. They're lightweight, fast, durable — efficient for a vast number of riveting jobs.

Shepard . . .

Fastest structural shop riveter available is the Shepard Pinch Bug. Its high speed and 20-inch reach are among the features that make the Shepard so outstanding. It's rugged, dependable, accurate.





A squeeze riveter for every purpose!

There are over 700 styles and sizes of Hanna Squeeze Riveters . . . pneumatic and hydraulic . . . portable and stationary . . . from 2 inches to 21 feet in throat or reach . . . to drive hot or cold rivets of 3/16 inches to 2½ inches diameter . . . all reflecting over 40 years of Hanna engineering skill and experience.

In addition to recommending and supplying the squeeze riveter to fit your job, Hanna will suggest dies, fixtures, production details and other desired information to insure economical, efficient riveting.

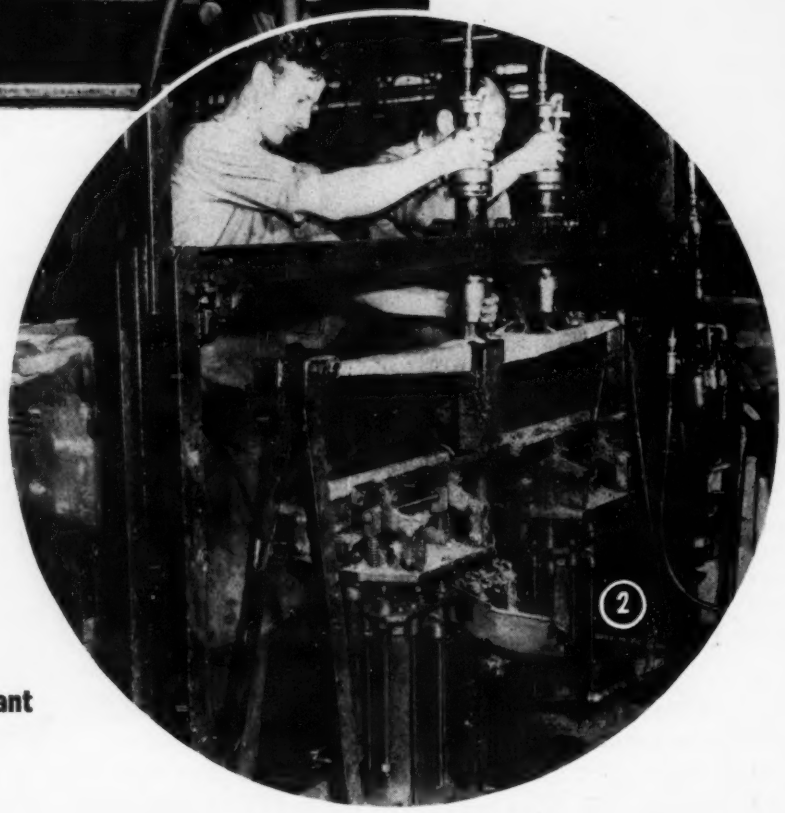
Send for New Pinch Bug Riveter Bulletin 245

Hanna Engineering Works

1765 Elston Avenue • Chicago 22, Illinois

Fig. 1—Spring leaves are clamped in position by an air vise; pneumatic wrench pulls down the nut

Fig. 2—Springs are covered with a metal coat as shown. Air rams from the floor push spring out in straight position while two workers, each using an air-operated hammer, apply cover



SPRING STEELS

'Air-Fabricated'

. . . at West Coast automotive parts plant

RAPID expansion of West Coast automobile assembly plants is reflected in the rising production of United States Spring & Bumper Co., Los Angeles, which specializes on spring steel products such as heat-treated farm tools and road guards as well as auto leaf springs and bumpers. One of the aids in keeping pace with production demands comes from the company's applications of compressed air.

In assembling leaf springs, separate leaves of varying size are placed in order by workers on both sides of a moving table. Near the end of the table, a worker picks up the unassembled leaves, centers them with a bolt, places the assembled spring in an air-clamped vise and pulls down the nut on the bolt with a pneumatic wrench, Fig. 1.

Certain types of springs are greased before assembly. In such instances, air pressure on the barrel of grease at the start of the line powers the grease machine. At the end of the line, after assembly, is an air-operated bulldozer which tests the spring for elasticity. Here the spring is placed in a fixture and the flexible power of an air piston puts the spring to test.

A similar test is made for load. An air piston applies pressure of 900 pounds, measured by a scale in the rear of the testing machine, to each assembled spring. These positive testing methods prevent any faulty spring from leaving the factory.

Next assembly step is to place the clip on both ends of the leaf spring. The company has designed a method for doing this with a press to which has been added an air piston on each side of the die. One part of the clip is preformed to hook over the spring before it is placed in the press. The spring clip is then secured by two strokes of the press while the air pistons lace it into place between strokes. This application of compressed air released one man for other work, since otherwise two men would be necessary on this operation.

Applying a metal cover to leaf

Fig. 3—Spring steel is coiled into a cultivator shank on this special machine. Air piston beneath brings up mandrel as table turns with clamped shank: on top of table, an air-operated cam, seen at center, provides coiling action. Data and photos courtesy Compressed Air & Gas Institute

springs is a quick and simple operation when air hammers and air pistons are used, Fig. 2. The cover is placed on the spring, the air piston straightens it out in a fixture and two men seal on the cover with air hammers, which are supported on the fixture for this work.

Every step in the assembly of leaf springs employs air in one way or another, as do many of the other operations. Dies on presses are cleaned out. Punched slugs are rejected. Oven doors are raised and lowered. Paint is sprayed. Burdens are lifted by air hoists.

Coiling Shanks — An interesting example of the use of compressed air in the farm tool department is the especially-designed machine for coiling cultivator shanks, Fig. 3. While the bar is still hot after shearing, it is clamped in the special machine, on a turntable. Air-operated cam at the center of the machine provides the coiling action and an air piston beneath the machine brings up the mandrel during the turning action. Cushioning characteristic of compressed air helps considerably in putting a double coil in the spring steel bar.

Of several uses for pneumatic tools in the spring steel products plant, typical applications would be in various grinding jobs and the use of lightweight, but amply powerful, pneumatic brushing tools for removing burrs and mill scale from road guards before they are prepared for spray painting.

In the dozen or so tanks used in nickel plating automobile bumpers, a perforated air line at the bottom of each of these tanks of cleaning solutions agitates the liquids.

Air power is produced by two stationary air compressors of 500 and 620 cubic feet per minute capacity, delivering air at the point of use at around 90 pounds per square inch pressure. Both are two-stage, horizontal compressors. In addition, the company uses many small blowers and also has two large centrifugal blowers of approximately 4500 cubic feet per minute capacity each. This low-pressure air is piped to provide cooling at presses and other hot working areas. Both of these air compressor units deliver air at approximately 20-ounce pressure.

Inventors Council Lists Needed War Inventions

Conversion of light and heat energy into electric energy are among the items in the latest list of technical problems affecting national defense released by the National Inventors Council, which hopes that American inventors will submit solutions or suggest approaches which may lead to solutions of these problems.

Other technical problems on the list are development of new "sandwich" core materials for the construction of aircraft and of a device for testing such cores; methods for simplified frequency control of radio equipment, either with synthetic quartz crystals or magnetostriction units; instruments for the measurement of humidity, for testing stresses at high temperatures, for automatically adjusting propeller pitch, and for examining the inside of gasoline drums. Also needed are new construction methods for ultra-lightweight radio equipment; more satisfactory miniature batteries; a high-speed electronic telegraph printer; more efficient collapsible field antennas; an automatically controlled gasoline nozzle; and a lightweight expendable pallet for warehouse use.

The list, available from the council in care of the Department of Commerce, was compiled in co-operation with the armed services. A statement of each problem is given, together with approaches made to date, and their deficiencies or defects.

Stress Analysis Group's Latest Papers Published

Society for Experimental Stress Analysis, through Addison-Wesley Press Inc., Cambridge, Mass., has recently published the tenth of a series of books containing information dealing with stress distributions in structures and machine parts, and method used for their determination.

The latest publication, Vol. V, No. 2, of the society's proceedings contains four papers devoted to the photoelastic method of stress analysis and its techniques, and four discussing the theoretical aspects and corresponding experimental studies of stresses set up by shock and impact. Also included are papers on the following subjects: Measurement of large strains beyond the yield point; technique of testing stiff panels in edgewise compression; a three-component force recorder for a mooring mast; evaluation of landing stresses in aircraft; a strain gage balance system for a supersonic wind tunnel; evaluation of stresses in aneroid capsules; a discussion of allowable stresses for steel members in fatigue; and an analyis of the stress distribution in a fifty-foot Horton sphere.

—o—

Floor radiant heating has been installed at the Fort Wayne, Ind., plant of United States Rubber Co., to solve problems resulting from accumulation of fine sand on heating elements and piping.

French Heavy Forging Group

HOLDS FIRST TECHNICAL MEETING

FIRST technical meeting of representatives of the French heavy forging industry sponsored by the Chambre Syndicale de la Grosse Forge Francaise was held at the Centre Marcelin Berthelot in Paris on May 27-29. Since the organization was founded in 1945 it has been active in all matters dealing with all technical matters of interest to the industry.

At the invitation of the Chambre Syndicale a number of representatives of the British forging industry were present and contributed three papers and some films. Mr. Bellier, presiding at the opening session, stressed the necessity of avoiding defects in heavy forgings in order to prevent costly rejects.

"Improvement of the Compactness of Forging Ingots by Reheating of the Head," was the title of the paper presented by Mr. Granger, chief engineer at Acieries de Firminy. Although no such method would take the place of correct practice, he stated, maximum compactness can be gained and pipe reduced by means of an electric arc which descends in the mold as level of molten metal goes down.

Crankshaft Forging Process—Description of a new process for forging crankshafts called Fibrage Integral R.R. was the subject of a paper presented by Mr. Vialle and Mr. Lafont of Usines de Saint Chamond. Initials in the process are those of the inventor, Mr. Roederer. Principle of the process is to reduce as much as possible the amount of metal to be removed by machining and to ensure parallelism between fibers of the ingot and profile of part to be forged.

Between the ram and anvil or table of a forging press is placed a tool consisting of: A slotted table which is placed on the anvil of the press, two wedges that can travel toward each other along the slotted table, a cross piece which is fixed to the ram of the press and to which are fixed two triangular parts forming ramps which slide along the two wedges, two bushings each of which holds one of the bearings of the crankshaft on each side of the crankpin, two hydraulically operated pistons which keep bushings in position and a punch and anvil which serve to throw the crankpin off center when the crosspiece is pressed down during press operation. Each crankpin is pressed down individually and after each operation the sides or disks on each side of the crankpins are shaped by action of bushings and wedges.

With this method, it is claimed, that the axial zone of ingot is always at the proximity of the neutral fiber of the crankshaft and there is no risk of this zone being reached during machining operations. Other advantages claimed are: It is possible to start from a smaller ingot than by ordinary methods, mechanical properties are improved, machining is reduced and no gapping is necessary.

Forging Manipulators—Development of forging manipulators combined with overhead cranes and electrically controlled from a distance was the topic of a paper contributed by F. J. Somers, Walter Somers Ltd., Halesowen, England. Forging shop must be planned to get the greatest efficiency from a manipulator, he stated, and the rhythm of production is governed by capacity of manipulator. Apparatus must be designed for particular type of production desired in order to derive its benefits.

Description of a cost system in a heavy forging works was presented by Mr. Friart, Usines M. Dembiermont & Cie., Paris. The system used enables cost of production to be obtained for a single job or for jobs of a similar nature. A chart covering the activities of the whole undertaking enables the overhead to be allocated to appropriate sections.

Progress made in recent years in regard to power, capacity and efficiency of heavy forging presses was described by J. Sanderson, Davy & United Engineering Co. Ltd., Sheffield, England. He pointed out that there were practical limitations to the size of forging presses and that the enormous presses used by the Germans to manufacture guns of large caliber are not required for peacetime uses.

Spindle Nose, Chuck, Tap Standards Published

Latest information on spindles and chucks for lathes is combined in the new edition of the American standard spindle noses for tool room, engine, turret and automatic lathes, published by American Standards Association, New York, bearing the designation B5.9-1948. The spindles included cover requirements for all types and sizes of lathes from 6-inch bench lathes up to the largest turret lathes and large hollow spindle lathes.

Specifications for the type L spindle, which did not appear in the previous (1936) edition, are included. In addition, it includes dimensions of other sizes of spindle noses developed in the intervening period. More complete information on gages and more extensive recommendations on the use of these spindles is also given. Sections on nomenclature, gages and methods of gaging, chucks, spindle noses recommended for bench lathes, tool room lathes, engine lathes, turret lathes, single spindle automatic lathes and other applications are included in the standard, along with 39 tables giving complete dimensions and tolerances.

American standard for taps, cut and ground thread, B5.4-1948, takes into account the new styles and sizes of taps which have been adopted in the nine years since the previous standard appeared and omits those which have become obsolete. According to the committee that developed the standard, even today changes are being made as a result of the activities of the various commissions which are at work on national and international screw thread standards. With little prospect of threads becoming standardized in the near future, it was thought well to issue a revised standard which would incorporate steps taken to date.

HALF

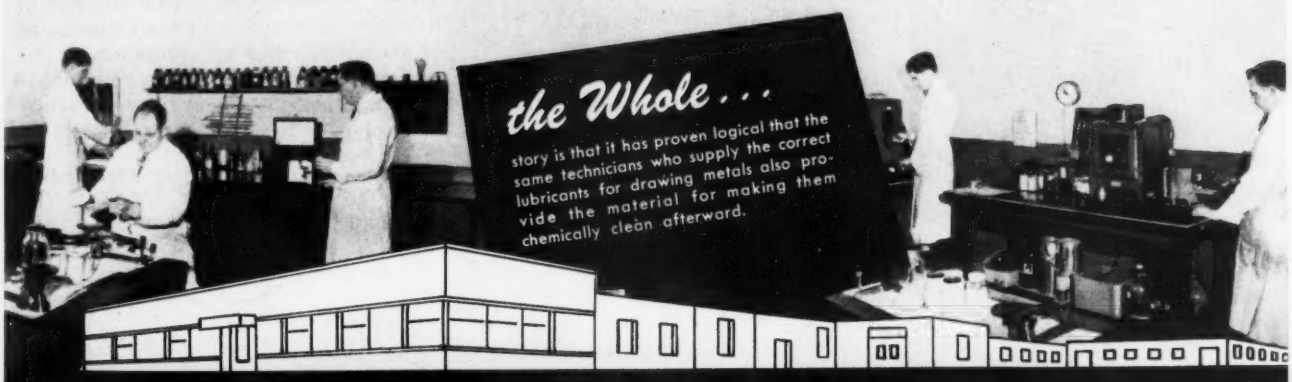
pH control

the other HALF

SUPER-DRAW

Half of this message has to do with NORTHWEST products and processes for chemically cleaning ferrous and non-ferrous metals preparatory to plating, vitreous enameling, painting, etc., each problem involving a specific programing of one or more of the thirty-five standard NORTHWEST Cleaning Compounds including Electrolytic, Immersion, Solvent, Spray, and Water Wash types . . . the "Lo-Hi" pH process of chemically cleaning metals, preparatory to plating, porcelain enameling, etc., makes practical a control that management can plan on in these departments regardless of the type of metal or soil . . .

is concerned with metal forming lubricants developed for ferrous and non-ferrous metals in both pigmented and non-pigmented form . . . SUPERDRAW products are specifically compounded for: 1. Brass and Brass Alloys, 2. Cold Rolled Steel, Enameling Iron, Stainless Steel and Aluminum, 3. Alloys of Steel, Aluminum and Copper . . . SUPERDRAW compounds will handle light, medium, and heavy operations . . . may be applied by brush, roller, spray, or dipping . . . A request on your letterhead will bring a technician to consult you on your drawing and cleaning problems . . .



the Whole . . .

story is that it has proven logical that the same technicians who supply the correct lubricants for drawing metals also provide the material for making them chemically clean afterward.

LO HI pH

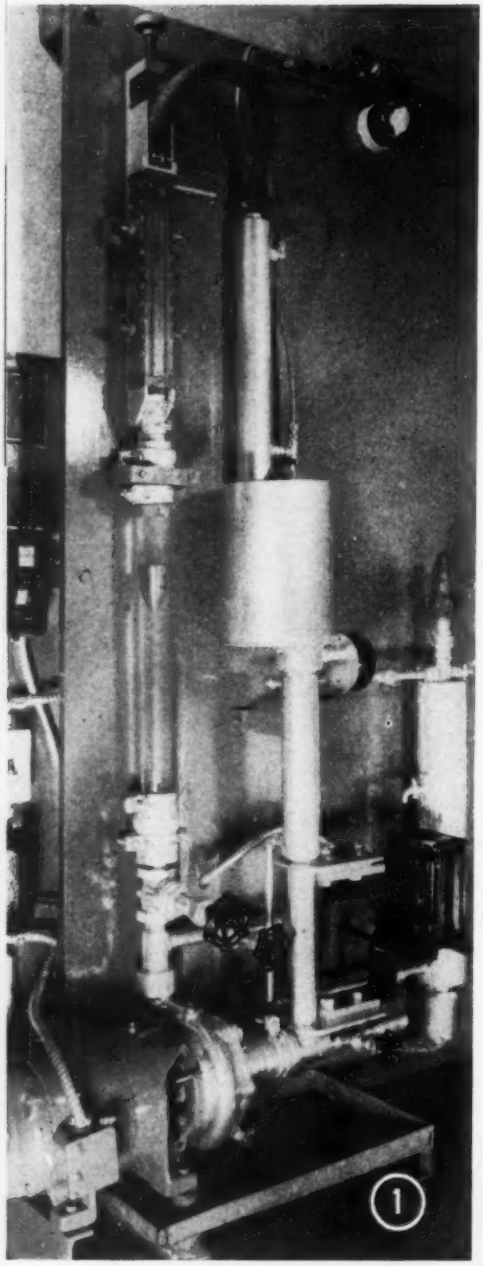
NORTHWEST CHEMICAL CO.

9310 ROSELAWN DETROIT 4, MICH.

pioneers in pH cleaning control—serving you since '32

Evaluation of Strip Plating

...aided by use of circulating electrolyte cell



Still plating tests for studying effect of variations in electrolyte composition and temperature upon the character of the tin deposit are of little value due to the extremely low current densities permissible in comparison with plating carried out upon a rapidly moving cathode. Described herein is an apparatus that was developed to duplicate in the laboratory as closely as possible conditions existing in a commercial installation

By R. A. DIMON
Electrochemist, Research Laboratory
Carnegie-Illinois Steel Corp.
Pittsburgh

SINCE 1937, when Carnegie-Illinois Steel Corp. began the electrolytic coating of strip steel with tin, speed of strip travel through the coating lines has gradually increased as a result of mechanical improvements, installation of units with longer plating tanks, and the use of higher current densities. In studying the effect of variations in electrolyte composition and temperature upon the character of the tin deposit it was soon recognized that still plating tests were of little value because of the extremely low current densities permissible in comparison with plating carried out upon a rapidly moving cathode. In fact, the ratio of maximum permissible current density for still plating to that for coating of strip traveling 500 feet per minute is approximately 1 to 10.

Apparatus described here was developed to duplicate in the laboratory as closely as possible conditions existing in a commercial unit so that current density limitations of various electrolyte compositions could be translated directly into actual full scale operations.

By whatever means agitation is achieved, its effectiveness results from preventing too rapid depletion of the metal ions in the cathode film and reducing or eliminating the metal concentration gradient in the main body of electrolyte between electrodes.

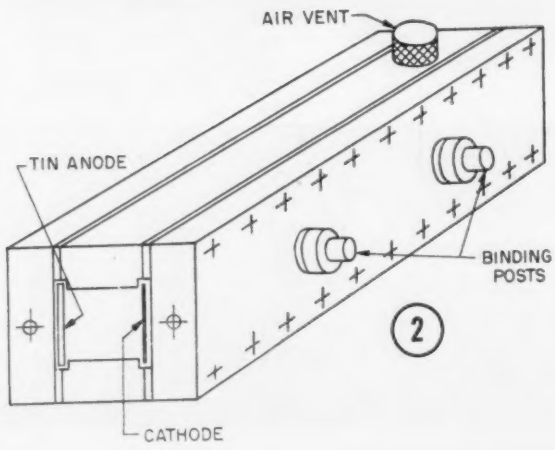
Literature contains relatively few references to quantitative studies of agitation. In 1936 rotating cathode tests were carried out at our laboratory in connection with our work on acid tin plating electrolytes. We felt, however, that a true measure of the relative speeds of the cathode and electrolyte was not obtained by the device since the film of electrolyte immediately adjacent to the can body assumed, to a degree difficult to

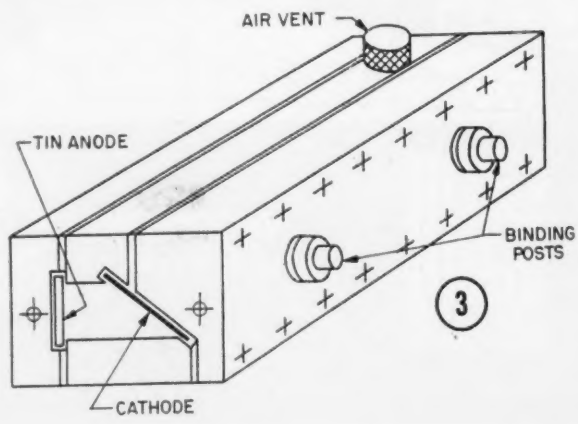
Fig. 1—Circulation cell assembly

Fig. 2—Parallel electrode cell

Fig. 3 — Circulating "hull cell"

From paper presented before American Electroplaters Society, Atlantic City, N. J., June 28-July 1, 1948.





5 concrete answers

TO YOUR REFRACTORY PROBLEMS

B&W Refractory Castables—possessing all the easy-to-use properties of ordinary building concrete—are supplying the cost-cutting solutions to many furnace construction and maintenance problems. Five different types are available to cover the wide range of conditions in modern furnaces:

1 KAOCAST . . . a 3000F castable with high spalling resistance and low volume change . . . gives exceptionally long life under severe service. Bulletin R-21.

2 KROMECAST . . . a chrome-base castable possessing unusual hot load strength . . . ideal for high temperature furnaces where resistance to molten materials, mill scale and other reactive products is essential. Use limit 3100F. Bulletin R-26.

3 HYDROCHROME . . . another chrome-base castable, particularly suited for water-cooled boiler furnaces and for furnaces with moderate temperatures where slag and scale resistance are needed. Use limit 2800F. Bulletin R-27.

4 B&W BAFFLE MIX . . . an hydraulic setting castable for monolithic baffles, door linings, special shapes, etc.

Type A—a "short" mixture that pours readily and flows into small spaces.

Type B—a more plastic and adhesive mixture for patching purposes.

Use limit 2600F. Bulletin R-1-F.

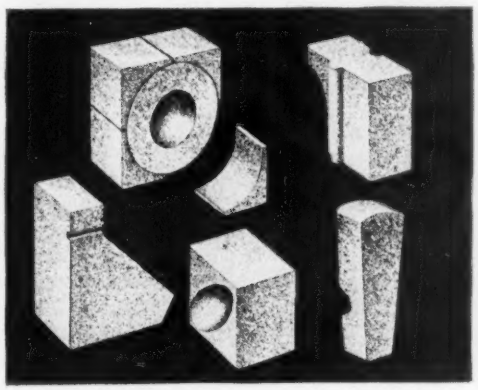
5 INSULATING CONCRETE-MIXES . . . lightweight, highly effective insulating materials ideal for protecting cartops and furnace steel, for lining ducts, etc.

B&W K-20 Concrete-Mix for 2000F service

B&W K-22 Concrete-Mix for 2200F service

B&W K-20 or K-22 Concrete-Mix for Cement Guns

Bulletin R-19.



These B&W Refractory Castables can be poured like ordinary concrete, plastered into place, or applied with a cement gun. They all save many hours in furnace construction and maintenance . . . and their durability will add greatly to the efficiency of your operations.

Write today for the desired Bulletins—or call your local B&W Representative. He will gladly help you select the castables that will simplify your furnace problems.

R331

B&W REFRACTORIES PRODUCTS

B&W 80 FIREBRICK • B&W JUNIOR FIREBRICK
B&W 80 GLASS TANK BLOCKS • B&W INSULATING FIREBRICK
B&W REFRACTORY CASTABLES, PLASTICS AND MORTARS

•

OTHER B&W PRODUCTS

Stationary & Marine Boilers and Component Equipment
Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers
Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

evaluate, the rotary motion of the cathode.

Straight Flow Cell—In order to overcome objections inherent in the rotary type of cell, we built in 1938 a straight flow cell in which electrolyte was pumped between the electrodes at a measured rate of flow corresponding to the strip speed with which we were concerned. This is the same as the parallel electrode cell now in use, although some modifications in the pump, flow measuring and temperature maintenance equipment have been made.

A question has been raised as to whether our "solution flow" cell did not produce an "opposite film effect" to that obtained when strip is passed through the electrolyte, due to the well known reduction in velocity near the walls of a pipe during viscous flow. We recognize that in this cell the velocity at the outer walls (electrodes) is less than at the center, although it is believed that this effect is much less pronounced than in the common illustrations depicting streamline flow, since all of our comparisons are carried out at circulating speeds well in excess of that at which turbulent flow occurs. However, it is our opinion that the same decrease in velocity occurs when strip is passed through the solution, due to the tendency for the liquid at the strip surface to assume the speed of the strip. In fact, we feel that there is no real difference between forcing the solution past the strip or drawing the strip through the solution, since it is only the relative velocities which affect the film at the cathode. Since commercial tin plating lines are not as simple as the above illustration, as they involve multiple passes, it is not our belief that the cell gives an exact duplication of line conditions. However, the correlation between the cell and full scale units has been close enough for direct application of the current density data obtained.

Circulation Cell Assembly—The so-called "circulation cell" has been designed to duplicate as closely as possible conditions present in passing strip through a tank at a given speed by pumping electrolyte past the test strip at the same speed. Means of measuring and controlling the solution flow, as well as other factors which influence plating, such as electrolyte temperature, plating current and plating time are also provided. This is shown in Fig. 1.

The cell itself is a square, hard rubber tube. Cross section of the orifice is 3/4 by 3/4-inch when both anode and cathode are in place. The cathode strips are cut 9.6 by 1 inches. Since edges fit into slots, the actual effective area is 9.6 by ¾ inches, which is 1/20 of a square foot. Thus, if a current of 5 amperes is used, the resulting cathode current density is 100 amperes per square foot. The anodes are of the same dimensions as the cathodes, except for greater thickness to allow for a large number of tests between anode changes.

Temperature Maintenance—It has been found convenient to provide, in addition to thermostatic control of solution temperature, means by which rapid heating and cooling can be accomplished for the purpose of dissolving addition agents and other substances in the electrolyte. Thermostatically controlled heating is obtained by use of a resistance heated tube.

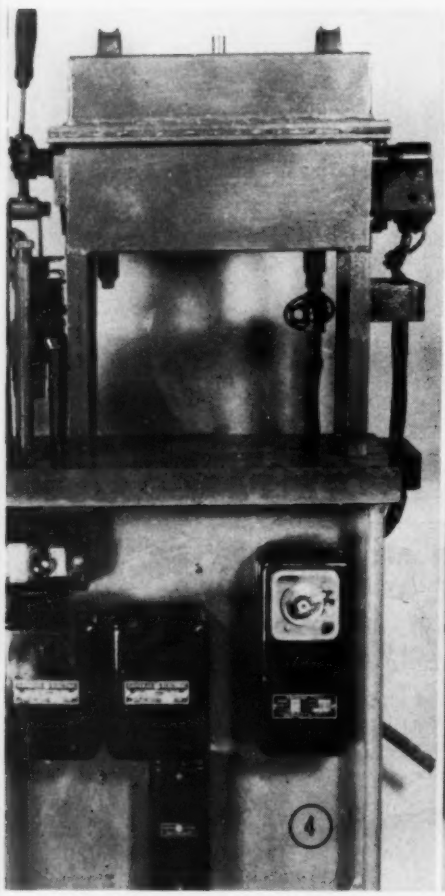
Plating time is so short in most of the tests that it is important that a consistent source of plating current be employed. Good results have been obtained with a low voltage generator excited by a rectifier such as is sold for charging batteries (input 110 volts alternating current—output 6 volts direct current). Voltage input to the rectifier is controlled by a variable voltage transformer.

Obtaining of a melted coating with a high luster is a severe criterion of the conditions employed during electrodeposition. We therefore concluded that a reasonably correct evaluation of our tinned strips could be secured if coatings were melted and quenched in a manner similar to that utilized on our commercial units. Our timer is set to quench the strip just after complete melting of the coating has occurred. It also opens the melting current relay. Set-up is shown in Fig. 4.

Reflectometer—A simple reflectometer, as shown in Fig. 5, was constructed to provide a numerical measure of the luster of our circulation cell strips. This reflectometer measurement is made after melting since it has been found that the range of values obtained between the strips after melting was about twice that existing between the same strips before melting.

As an illustration of the use of the circulation cell and auxiliary equipment a study was made of an acid tin plating electrolyte recommended by Pine. Variables studied were rate of solution flow; current density; electrolyte temperature; and tin and glue concentrations. Graphs are given in which the reflectivity measurement is plotted against these variables.

All of the strips were sheared from



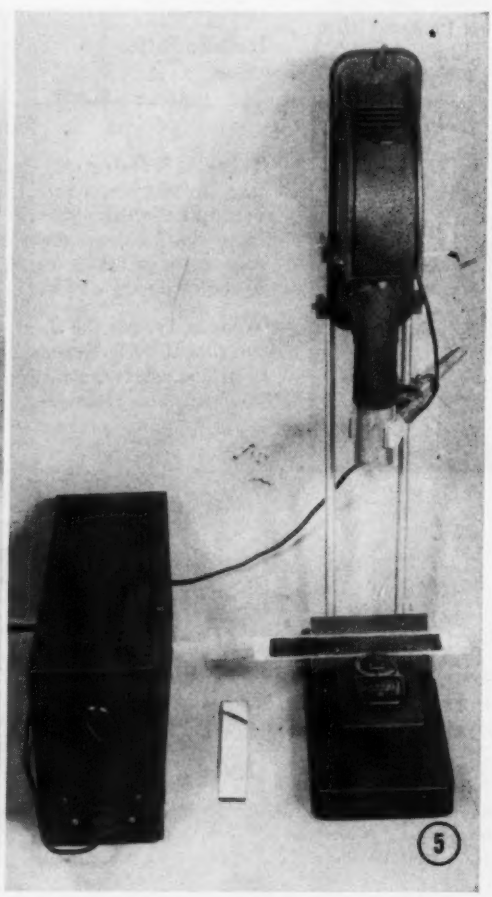


Fig. 4—Resistance melting unit

Fig. 5—Reflectometer as used in the set-up. All photos and drawings are used by courtesy of American Electroplaters Society

an adjacent area of the same cold-reduced, fully deoxidized coil of "black plate." Thickness of the steel was 0.010 inch and the finish the highest ordinarily employed for tin plate.

It has been found possible to secure adequate removal of the very thin oxide film present on fully deoxidized steel by allowing the acid tin electrolyte to circulate past the strip for a few seconds after the cell has been placed in the vise before initating current flow.

Operating Conditions—All deposits were of a coating weight of 0.5 pounds tin per base box (0.00003 inch thick) and the plating times were regulated to secure this coating at the various current densities.

A comparison between melted and unmelted samples made at a solution speed of 600 feet per minute illustrates that besides securing higher reflectivity values on melted coatings, the spread between good and poor plating is about double that obtained with unmelted samples.

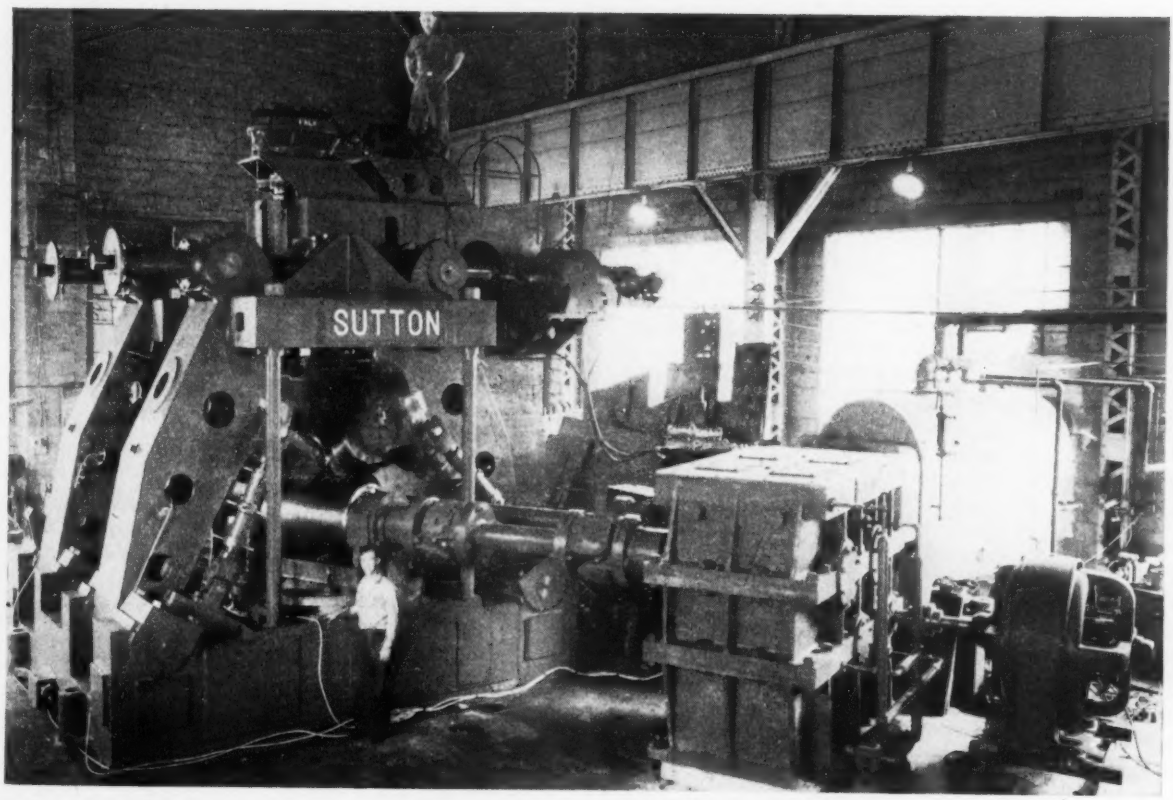
In the case of strips plated at 120, 100 and 80°F at solution flows of 0 (still plating), 100, 300 and 600 feet per minute, it will be noted that almost all of these curves are somewhat erratic at current densities between 25 and 100 amperes per square foot. However, this is a part of the curve with which we are not too concerned, since our commercial lines operate at 200 amperes per square foot or over. At the higher current densities the curves arrange themselves as might be expected from theoretical considerations. There appears to be a critical point in solution flow between 100 and 300 feet per minute, the gap between these two curves being much larger than that between the two lower or upper curves.

By varying the tin content (90, 60 and 30 grams per liter) rather than the electrolyte temperature, an improvement in plating properties at high current densities was obtained at the higher tin concentration, although the improvement was not as marked, over the ranges studied, as that produced by the changes in electrolyte temperature.

Variations in the glue content (1, 5, and 10 grams per liter) within the range studied showed that the highest reflectivity was obtained at the lowest concentration at both low and high current densities.

Conclusions From Experimentation—While the apparatus described is a useful laboratory tool in the study of electrolytes, it will be apparent that it does not determine such factors as the ease of control of the bath or the performance of addition agents in actual commercial operation. It does, however, furnish adequate data as to the optimum current density range of an electrolyte under conditions comparable to full scale continuous plating.

Thus from the data obtained upon the electrolyte described by Pine, we may draw the following conclusions regarding its current density range: 1.—An increase in the rate of solution flow (strip speed) raises the current density at which the best de-



QUICK STRAIGHTENING: Capable of straightening bar stock at a speed of 50 to 200 feet per minute, this new type machine, demonstrated recently at the Bellefonte, Pa., plant of Sutton Engineering Co., (STEEL, June 28, p. 51) can make the changeover from 5½ to 13⅜-inch outside diameter tube in 1 minute and 45 seconds. Quick shift is made possible by power-operated screw downs and automatic roll angle adjustment. The unit has seven rolls—clusters of three rolls at the exit and entry ends, with a middle pressure roll. No guides are used; the tube is in contact with only rolling surfaces. Capacity of the machine is rated in solids from 5½ to 12 inches and in tubing from 5½ to 14⅜-inches with 1½-inch wall and up to 18½ with ¾- inch wall, 90,000 yield

Do YOU think SURPRISE DEALS have any place in Our Government?

The telegrams and statements reproduced here tell the story of a Surprise Deal on the part of the War Assets Administration. Your government property was leased to Kaiser-Frazer in secrecy that closed the door to open bidding. The War Assets Administration made it impossible for The Wheland Company to know that this lease or sale was being considered. We are not fighting Kaiser-Frazer. We do most emphatically object to the "denial of rights" exhibited in the handling of this transaction and feel that the lease should be cancelled.

FRANK W. BOYKIN
1ST DIST., ALABAMA

HOME ADDRESS:
MOBILE, ALABAMA

COMMITTEE:
MERCHANT MARINE
AND FISHERIES

Congress of the United States
House of Representatives
Washington, D. C.

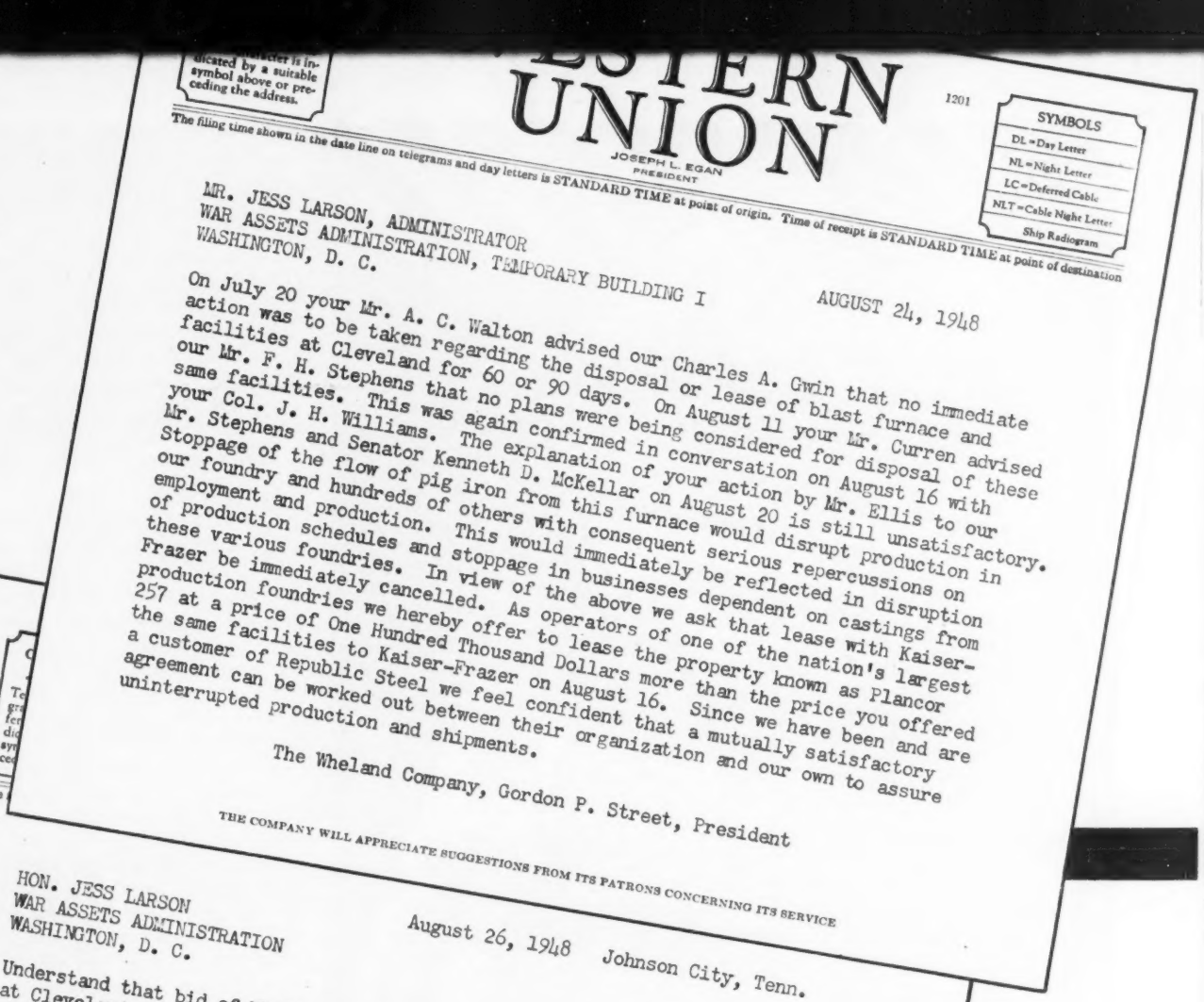
Statement of Frank W. Boykin
Congressman, Mobile, Alabama
To Associated Press and U.P. and
Trade Publications on August 27, 1948.

It is my opinion that Jess Larson, Administrator of War Assets Administration, in making a lease with Kaiser-Frazer for the blast furnace in Cleveland, Ohio on August 16, 1948, definitely disregarded the intent of Congress, if he did not actually violate the law. I have asked that this lease be cancelled.

Attached is a copy of telegram from The Wheland Company dated August 24 which is self explanatory. Mr. Street was called to Washington August 25th to testify before a joint session of Senator Wherry's Small Business Committee and Congressman Bender's Procurement and Building Committee. Unfortunately, this joint session was indefinitely recessed before Mr. Street's arrival in Washington. He left with Mr. Thomas M. Cooley, Associate Counsel for Mr. Bender's Committee, a sworn statement.

Mr. Larson granted Mr. Street an audience at five o'clock Thursday afternoon August 26th. He expressed regret in not knowing of the Wheland Company's interest in the Cleveland blast furnace and apologized for the failure of his subordinates to inform him of that interest. Mr. Larson, however, does not explain why his subordinates knew nothing of his personal negotiations with Kaiser-Frazer. He admitted that was the situation, however, and that it was an unusual one. Congress set up a Board of Review in the War Assets Administration to review and approve such transactions but Mr. Larson apparently ignored them also.

Everyone who wishes to should be given an opportunity to bid on property which has cost the Government $29,000,000. This lease would never have been executed in such secrecy if Congress had been in Session. Let's turn the light on such deals. I'm fighting mad and I am doing everything possible to break such things up.



ESTERN UNION

JOSEPH L. EGAN
PRESIDENT

1201

SYMBOLS
DL = Day Letter
NL = Night Letter
LC = Deferred Cable
NLT = Cable Night Letter
Ship Radiogram

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

MR. JESS LARSON, ADMINISTRATOR
WAR ASSETS ADMINISTRATION, TEMPORARY BUILDING I
WASHINGTON, D. C.

AUGUST 24, 1948

On July 20 your Mr. A. C. Walton advised our Charles A. Gwin that no immediate action was to be taken regarding the disposal or lease of blast furnace and facilities at Cleveland for 60 or 90 days. On August 11 your Mr. Curren advised our Mr. F. H. Stephens that no plans were being considered for disposal of these same facilities. This was again confirmed in conversation on August 16 with your Col. J. H. Williams. The explanation of your action by Mr. Ellis to our Mr. Stephens and Senator Kenneth D. McKellar on August 20 is still unsatisfactory. Stoppage of the flow of pig iron from this furnace would disrupt production in our foundry and hundreds of others with consequent serious repercussions on employment and production. This would immediately be reflected in disruption of production schedules and stoppage in businesses dependent on castings from these various foundries. In view of the above we ask that lease with Kaiser-Frazer be immediately cancelled. As operators of one of the nation's largest production foundries we hereby offer to lease the property known as Plancor 257 at a price of One Hundred Thousand Dollars more than the price you offered the same facilities to Kaiser-Frazer on August 16. Since we have been and are a customer of Republic Steel we feel confident that a mutually satisfactory agreement can be worked out between their organization and our own to assure uninterrupted production and shipments.

The Wheland Company, Gordon P. Street, President

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

HON. JESS LARSON
WAR ASSETS ADMINISTRATION
WASHINGTON, D. C.

August 26, 1948 Johnson City, Tenn.

Understand that bid of Wheland Company of Chattanooga for the blast furnace at Cleveland was for One Hundred Thousand more per year with option to buy at a higher price than provided for in the Kaiser-Frazer lease. The Wheland bid was submitted after Wheland was advised by high officials of your office that no lease was in prospect. Wheland has been customer of Cleveland plants and turning this furnace over to an outside user such as Kaiser-Frazer and thereby making its output unavailable will seriously interfere with production and labor at Chattanooga and elsewhere. In view of the substantial higher bid by Wheland the interruption of production and apparent secret dealing with Kaiser-Frazer by someone it would appear urgent this lease be cancelled so as to protect the interest of the Government and our economy which I urge be done at once. Please advise.

Carroll Reece

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

If you agree that Surprise Deals have no place in our Government, write your Congressman, your Senator, and to The Honorable Tom C. Clark, Attorney-General of the United States, Department of Justice, Washington, D. C. Insist that this lease be cancelled and that such Government property be offered equally to all bidders who are interested in acquiring this property and operating it for the benefit not only of their interest, but in the interest of the Nation as a whole.

THIS ADVERTISEMENT PLACED AND PAID FOR BY

The WHELAND COMPANY, Chattanooga, Tennessee

ESTABLISHED 1866—BUILDERS OF SAWMILL MACHINERY, OIL-WELL DRILLING EQUIPMENT AND OPERATORS OF ONE OF THE NATION'S LARGEST PRODUCTION FOUNDRIES

For two weeks, publication of this material was withheld. During those two weeks every effort was made to have our Government reconsider the hasty action in this Surprise Deal.

OK
SHEAR BLADES
are unequalled for
CLOSE TOLERANCE
UNIFORM HARDNESS
QUALITY STEEL
O. K. solid steel shear blades made in three grades, suitable for all jobs . . . O. K. Battle-Axe (High Carbon, High Chrome) for shearing up to and including ¼" mild steel or equivalent . . . O. K. Dura-chrome for shearing hot or cold plate steel up to 1" mild steel or equivalent . . . O. K. Standard for average runs and heavy plate shearing.
Gang Slitter Knives made to same quality and specifications, precision ground to ± .0002 tolerances on thickness, diameter, or bore. Extremely high finish. Also hardened spacers.
THE OHIO KNIFE CO.
CINCINNATI 23, OHIO
13
Gentlemen: Please send me without obligation your new catalog with specific data on Slitter Knives, Spacers, Straight Blades.
COMPANY
NAME
ADDRESS
The
OHIO KNIFE
Co.
CINCINNATI, OHIO, U.S.A.

posit is secured. 2.—Raising the electrolyte temperature also has the effect of increasing the optimum current density. 3.—An increase in the tin content of the electrolyte also favors the employment of a higher current density, and 4.—In the range of glue concentrations studied, an increase in glue content lowered the optimum current density.

Purchasing Simplified by NBS Specification Book

Scientific approach to purchasing has been greatly simplified since the organization of the National Bureau of Standards, according to E. W. Ely, chief, Commodity Standards Division.

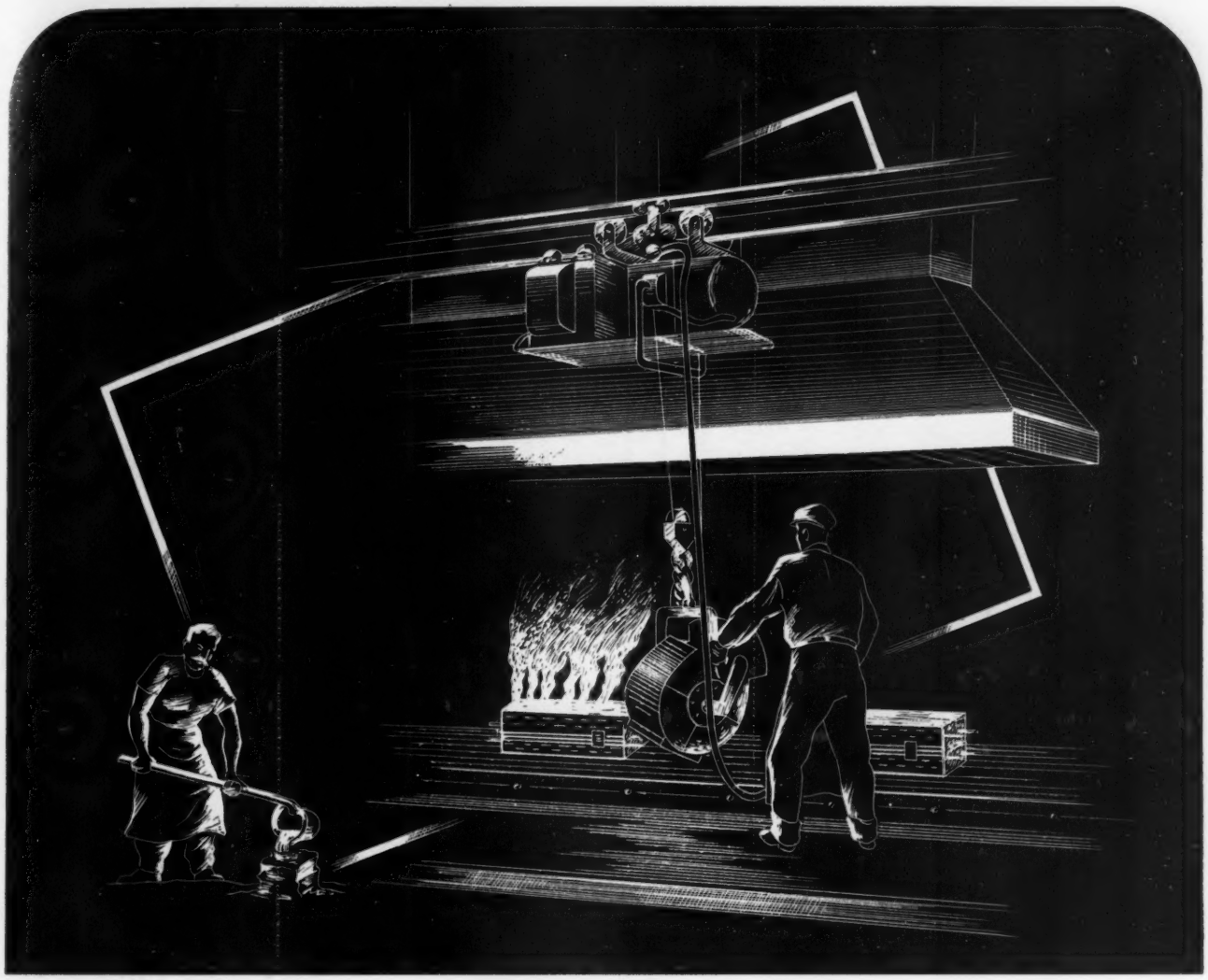
The only logical way to achieve economy in purchasing—through use of dependable specifications — has been facilitated, Mr. Ely states, by the bureau's compilation of all the standards and specifications in general use for commodities produced or purchased in this country. The compilation, *The National Directory of Commodity Specifications,* briefs, catalogs and indexes the information needed in buying all types of products. Wasteful searching and chance buying with incomplete information is thus rendered unnecessary.

Latest complete revision of the directory was published in 1945 and instead of issuing a new volume containing postwar information NBS has placed the new information in a 322-page supplement.

The two volumes provide a complete listing by name, designating number and issuing or sponsoring organization of all the standards, specifications and methods of test in general use in the United States. Included are the voluntary simplified practice recommendations and the voluntary commercial standards which have been developed under the industry co-operation procedure of the bureau. Each specification, of which there are a total of 44,000, is briefly summarized as to technical characteristics, scope and special application, and an extensive alphabetical index lists individual items under their trade and technical names in order to facilitate the location of the items.

—o—

Recently published by Engineering Experiment Station, University of Illinois, is a bulletin entitled "Rate of Propagation of Fatigue Cracks in 12 x ¾-inch Steel Plates with Severe Geometrical Stress Raisers". Object of the tests described is to determine extent rate of propagation of fatigue cracks in such plates is likewise related to Charpy notch impact value of the steel.



SINCE 1850

THE FOUNDRY INDUSTRY

in its advance from crude manual ladles to mechanical production processes, has been paced by the production and transportation of the necessary ores from which have been made the metals that have made its development possible.

LAKE SUPERIOR IRON ORE • FERRO ALLOYS
VESSEL TRANSPORTATION • COAL

THE Cleveland-Cliffs IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

Unit Casting Cost Greatly Reduced by

Automatic Molding

Using multiple molding methods, a completely integrated unit now in operation at Westinghouse's Cleveland foundry has cut floor area and manhours to a minimum. Installation marks the high point in general advance of molding machine design, improvement of core-blowing machine and use of automatic and semiautomatic principles in many individual mechanical operations

By JOHN A. SHARRITTS
Superintendent of Foundry
Westinghouse Electric Corp.
Cleveland

EVER-INCREASING requirements for maximum yield of high-quality castings at reduced cost have been met by what is believed to be the first practical, completely automatic molding unit for mass production of castings. Through the joint creative effort of International Molding Machine Co., La Grange Park, Ill. and Westinghouse Electric Corp., a self-contained unit has been developed. Operated by electrically-controlled air and hydraulic power, the unit is capable of performing all the related functions and operations required to produce molds from introduction of the sand ingredients into the conditioning system through and including completion of the molds stacked and ready for pouring.

The installation at Westinghouse's Cleveland plant is directed toward mass production of gray iron castings used in the manufacture of end brack-

From an article appearing in the June, 1948 issue of THE FOUNDRY.

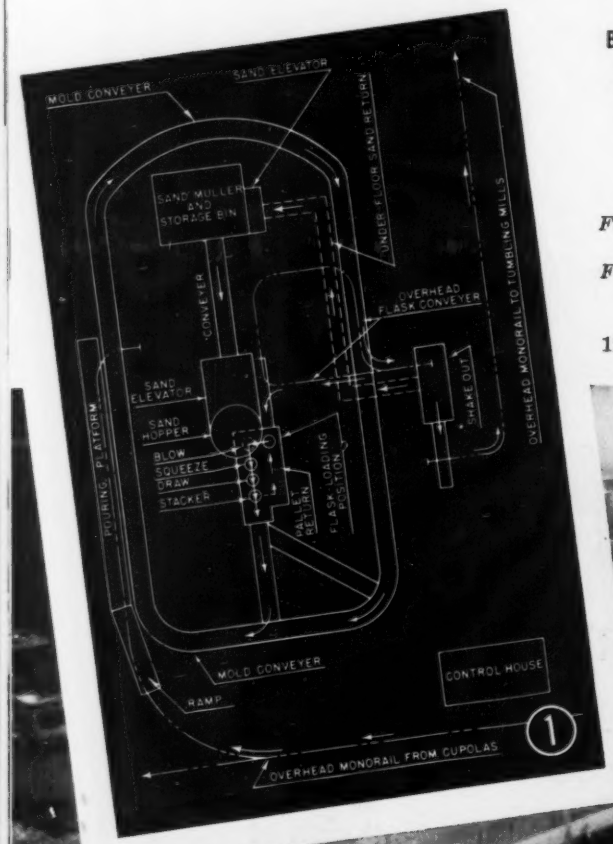
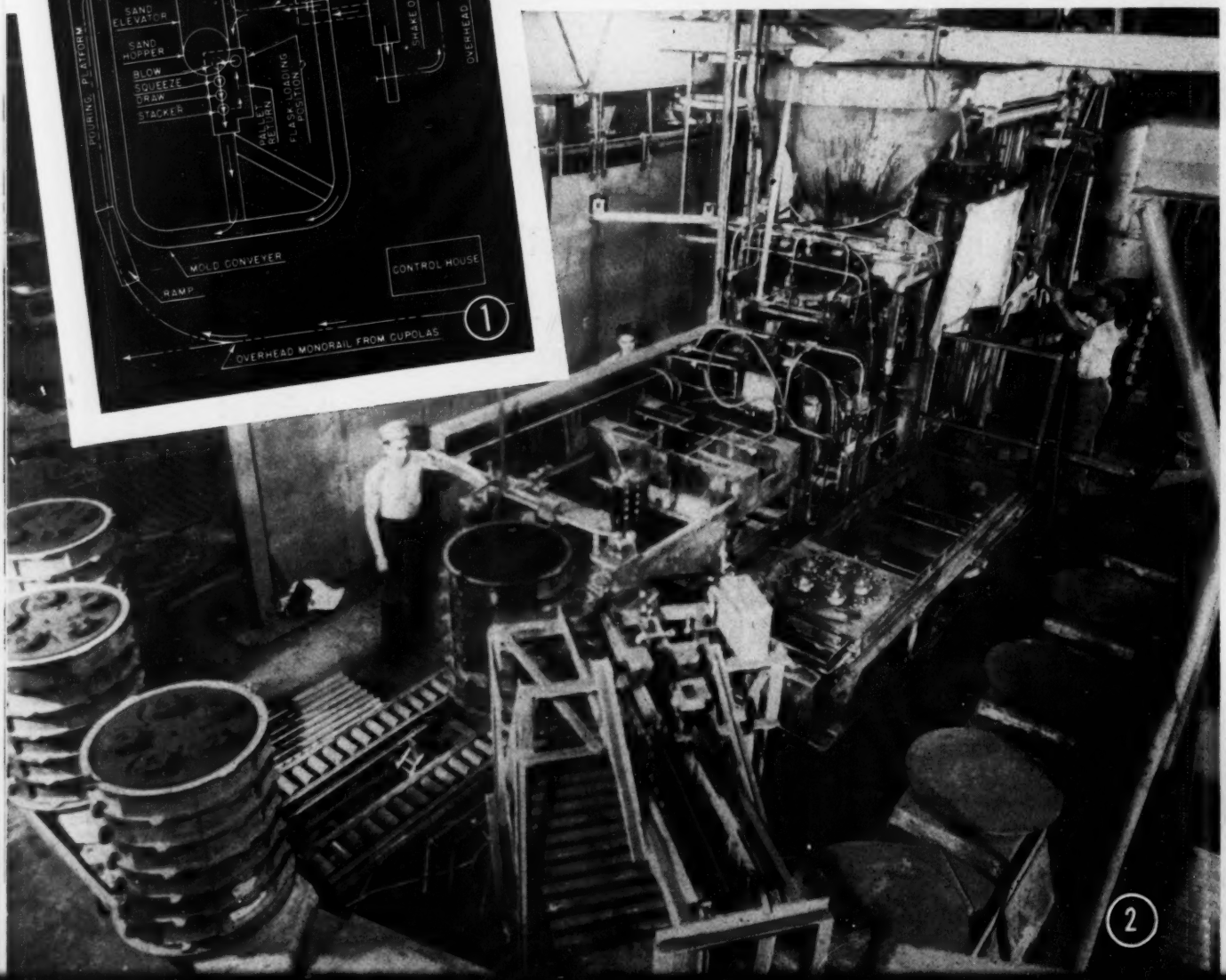
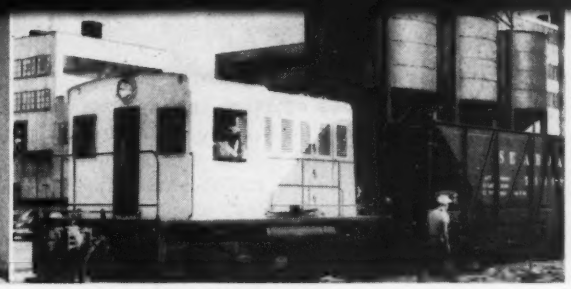


Fig. 1—Flow diagram of molding operations.

Fig. 2—General view of automatic molding unit



Whitcomb 50-ton Diesel locomotive hauls phosphate onto wet storage tressel for dumping at International's Mulberry, Florida drying plant.



Whitcomb 35-ton Diesel locomotive switching at International's new Noralyn mine.

New NORALYN phosphate mine, worlds largest, picks WHITCOMB DIESELS for 24 HOUR duty

The handling of 1,500,000 annual tons of phosphate, 400 cars per day, takes a lot of switching and hauling. And here, WHITCOMB Diesel locomotives play an *important* role in the operation of Noralyn Mine, International Minerals and Chemical Corporation's new nine million dollar phosphate mine near Bartow, Florida. Operating on a *24-hour-basis,* these economical, powerful; durable WHITCOMB Diesels perform three separate switching operations: From mine to carrier, from carrier to the Mulberry drying plant, then back again onto carrier tracks for shipment to consumers.

Throughout industry, from phosphate mining, to metal working, to oil, to lumber, you'll find WHITCOMB Diesel locomotives playing a star role in modern, progressive, profitable production. Whatever your industry, whatever your size, it will pay you to learn why so many *important* companies pick WHITCOMB locomotives for *important* jobs.

WHITCOMB Diesel electric and Diesel mechanical locomotives are available up to 95 tons.

Whitcomb Diesel locomotives operate on a 24-hour basis, handle up to 400 cars per day in three separate switching operations.

There's no power cheaper than Diesel; no locomotive finer than a Whitcomb.

THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILLINOIS

A subsidiary of

THE BALDWIN LOCOMOTIVE WORKS

ets for fractional horsepower motors. Several million of these castings are required yearly. Molding procedure performed by this unit is a simplified application of the multiple molding method. Round, tight steel flasks are used with five patterns per flask and with the flasks stacked six high. Twenty-five castings are poured for each stack of molds produced.

The complete unit manufactures the molds, arranges them in stacks and delivers the stacks to a mold conveyor. Operations required to perform this work are accomplished automatically, at a predetermined controlled speed, and with mechanical precision and uniformity.

Occupying a floor space approximately 48 feet wide and 100 feet long, the unit consists of the molding machine, a complete sand-conditioning and sand-and-mold conveying system, cooling hoods, shakeout, pouring loop, dust-collecting system, control room and other minor items of equipment usually found in a modern mechanized foundry molding operation. These items are arranged in a synchronized operating sequence.

Molding Machine—Major creative accomplishment has been made on the molding machine, which may be considered the heart of the automatic molding unit. The machine is a self-contained unit approximately 18 feet long, 7 feet wide and about 15 feet high. It rests on a shallow foundation extending about 18 inches below the floor level. The machine is located on the inside of the mold conveyor at one end of the loop.

Four principal work positions in the molding machine may be identified by the work performed and the order of performance as blow, squeeze, draw and stacking positions.

Pallet plates on which cope patterns are mounted, are moved through the work positions of the machine on a rectangular course in a counter-clockwise direction. Travel of the pallet plates around this rectangular course is made up of a series of intermittent movements during which the pallet plates are engaged by a positive drive mechanism which controls and locates their movement. After the mold has been completed and the pattern drawn at the draw position, the pallet is carried across to the return side of the rectangular course and moved around to receive the empty flask and start the next cycle.

Work Positions—First of the four principal work positions is a specially designed core blower of the hydraulic type which measures and places the sand in the flask and produces what may be described as a preform of the mold. Second, a hydraulic squeezer produces the accurate, finished mold impression from the preformed mold as received from the blower. In the third position, the draw machine lifts the flask and completed mold from the pattern pallet plate and conveys the flask and mold to the stacking position.

Fourth, the stacking machine receives the completed mold from the draw position, one flask at a time and arranges the molds in stacks of six, closing each mold cavity as the stack is accumulated. These related functions are electrically timed and controlled to produce the completed stack of molds in continuous sequence.

Sand Conditioning System—Sand-conditioning and sand-and-mold conveying systems, are of major importance in the arrangement and overall operation of the unit as a whole. The sand system contains the usual equipment, including mixing mill, conveyors, elevators, bins, disk feeder, shakeout, dust collector and related minor items all designed and built to perform their required functions as integral parts of the unit proper. The mold conveyer is a connected series of plates supported by carriages moving on rails, and forms a loop completely surrounding the other equipment with the exception of the shakeout and sludge discharge from the dust collectors which, for obvious reasons, are located outside the conveyor loop.

Stacked molds are poured by a

Fig. 3 — Multiple molding produces casting gates like these

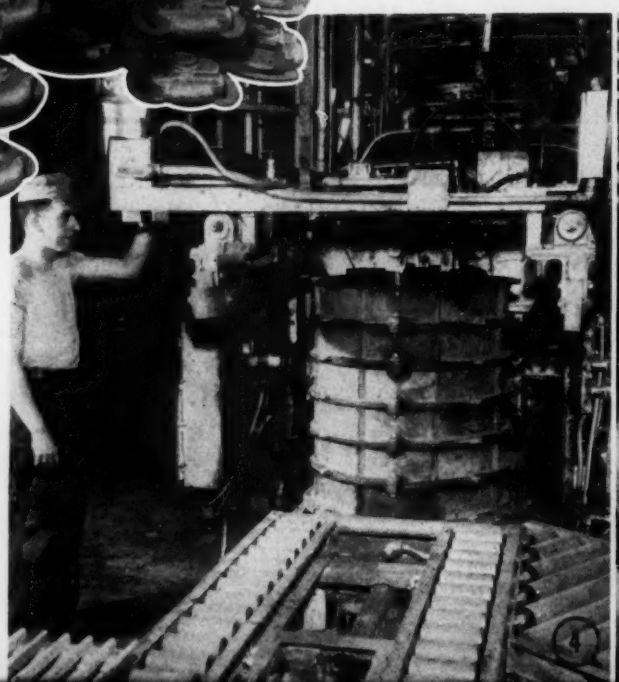
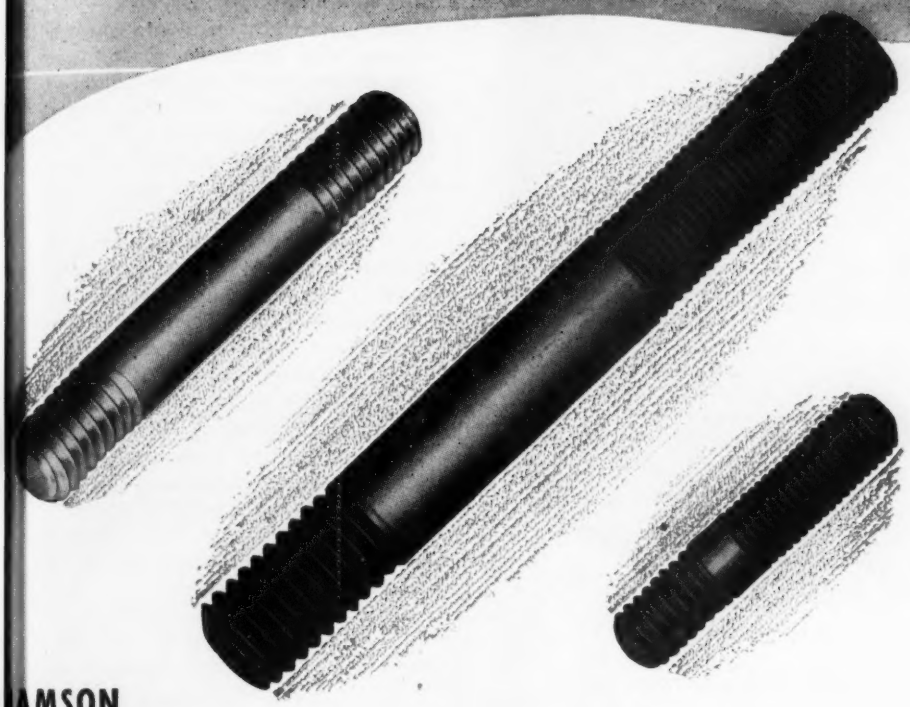


Fig. 4—Completed stack here is ready to be pushed automatically onto the conveyor system

Fig. 5—Cores are set as shown at the stacking position

Star Performers

for PRECISION and HOLDING POWER!



LAMSON MILLED STUDS

Lamson Milled Studs are a great deal *more* than accurately made threaded fasteners. They are precision engineered parts—manufactured on the most modern equipment and tolerance-controlled for ease and speed in assembly operations.

Threads and shanks are true and concentric; which means that Lamson Studs turn straight in tapped holes and stand straight and true to receive other parts. There is no fumbling or forcing to assemble mated parts.

Lamson Milled Studs are available with standard length threads or can be made to order with any required special thread length. We are also equipped to manufacture precision aircraft-quality studs, having made millions of them within tolerances of two ten-thousandths of an inch.

LAMSON LOK-THRED STUD

This new patented "super" stud fits into standard tapped holes, yet it *locks* and *seals*. For complete technical information on the Lamson Lok-Thred Stud, send for our free illustrated LOK-THRED booklet.

THE LAMSON & SESSIONS COMPANY
1971 West 85th Street • Cleveland, 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

SPECIAL PURPOSE
Lamson + Sessions
FASTENERS

BOLTS • SEMI-FINISHED NUTS • LAMSON LOCK NUTS • MILLED
ELEVATOR BOLTS • STOVE RODS • TRACTOR BOLTS and HI-I BOLTS • SH
CENTER BOLTS • HUB and WHEEL BOLTS • MACHINE SCREW LTS • BRAS
BARREL NUTS • OBLONG NUTS • CABINET BED BOLTS • AIR NUTS and SCREWS • S
SERTS • EYE BOLTS • CLEVIS PINS • HINGE PINS • TINNER THUMB SCREWS • FIN HEAD BOLTS •

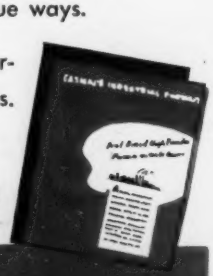
GASMACO Water Sealed
Rotary Hearth Furnace
with Special Syphon Vents
FOR FORGING, ANNEALING
and HEAT TREATING

This is one of a complete line of Rotary Hearth Furnaces built in various types and engineered for specific applications of forging, annealing, heat treating, tempering and clean heat treating.

Each furnace is carefully designed to require the least possible operating labor and to reduce maintenance costs.

The floating hearth plates (patent applied for) prevent warpage and maintain a uniform load on each roller. Another and very important feature is the water sealed hearth using patented syphon vents (illustrated in drawing above) to short circuit any water vapor, formed above seal, directly to the flue ways.

It will pay you to investigate these outstanding furnaces. Let's talk over your heat treating problems.



WRITE FOR FOLDER A-100

THE GAS MACHINERY COMPANY
16116 Waterloo Road • Cleveland 10, Ohio

pouring crew. Metal is brought direct from the central melting section of the foundry in covered, insulated, geared ladles of the cylindrical type. The pouring ladles are mounted on electric hoists and are conveyed to the pouring area by means of an overhead handling system. Pouring platform is located on the outside of the conveyor loop at conveyor height and is approached by a ramp from the foundry floor level. Stacked molds with weight and runner cup in position are approximately 43 inches high above conveyor level.

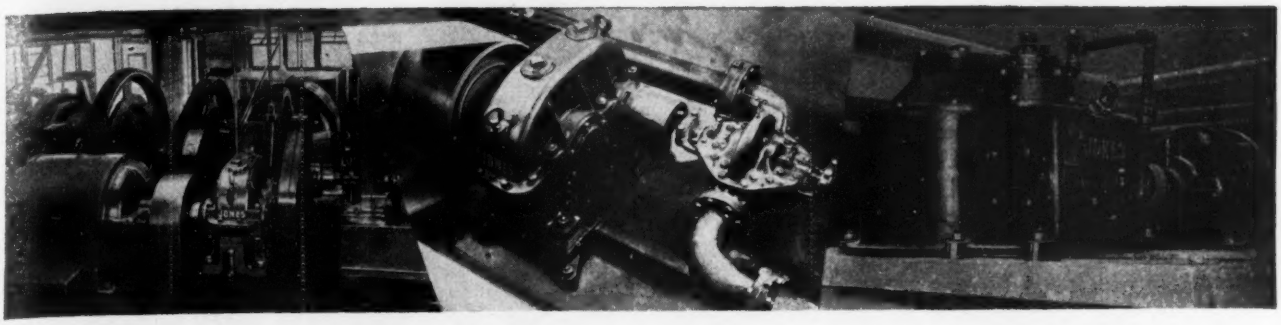
An electrically-operated elevator section with pendulum control has been incorporated in the overhead handling system to raise the pouring ladles to the required height to bring the ladle lip over the runner cup when the mold stacks are in position on the conveyor. Mold stacks are poured through a central sprue and a carefully worked out gating system.

After pouring, the stacked molds are conveyed by the mold conveyor in a series of intermittent movements around the conveyor loop and through the necessary cooling period to the shakeout. Here each stack of six flasks is picked up by a specially designed air-operated shakeout bail with overhead handling facilities and carried over the shakeout. Here the sand and castings are shaken out on an inclined, vibrating screen. The stack of empty flasks is deposited adjacent to the loading position of the molding machine. As sand and castings fall onto the vibrating screen, sand is returned to the system and castings are carried over the end of the screen.

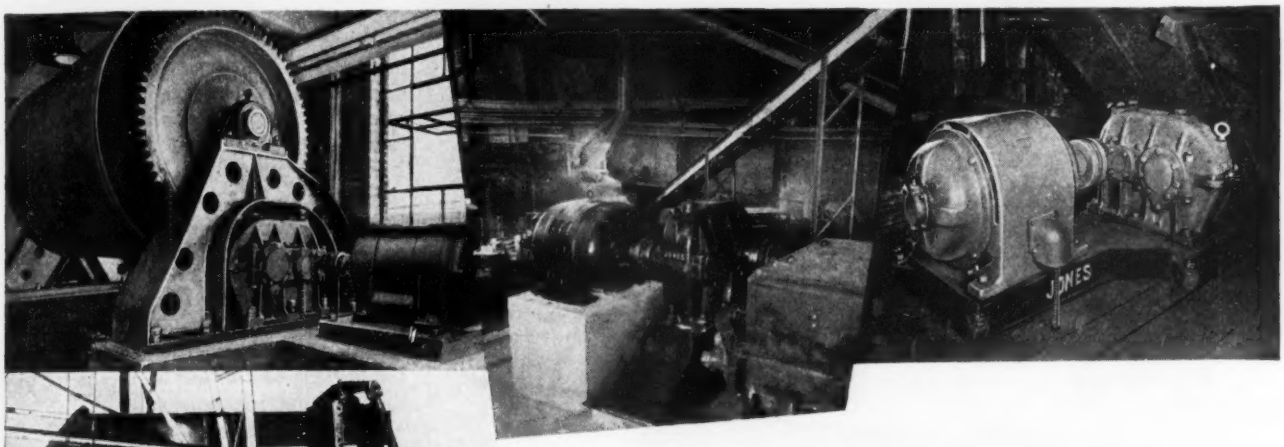
Flow of castings from the shakeout is gathered in casting containers which are picked up by a power-driven electric hoist and taken to the cleaning mills.

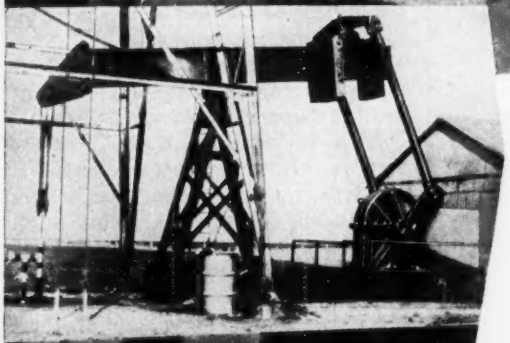
Control Boards—Of extreme importance in the overall operation of this automatic molding unit is the electrical control system, which is the nerve center of the unit. Designed to meet specified requirements, the system is housed in a specially-constructed dust-proof room located in the foundry and adjacent to the unit.

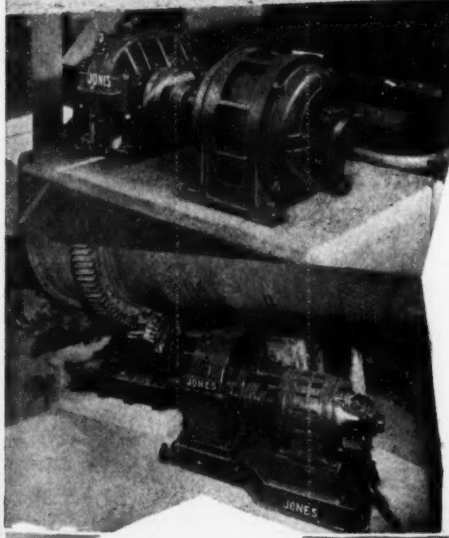
Panel boards are arranged in two banks, one controlling the molding functions and the other sand and conveyor systems. While the master control switches are located in the control room, there are push button controls at each of the principal work positions throughout the unit. Any single operation can be performed by manual control or the related mechanical movements common to any one function can be set for automatic operation.



JONES DRIVES FOR INDUSTRY







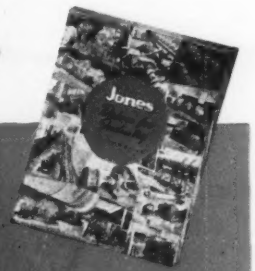
★ For many years the W. A. Jones Foundry & Machine Company has been called upon as a consultant, to help solve a great variety of difficult drives involving the use of speed reducers, gears and other transmission machinery. In many cases these installations have called for the development of special equipment, designed and built to suit the specific requirements of the project.

As a result of these years of experience, involving numerous special problems in the mechanical transmission of power, the Jones organization has collected a vast amount of technical data relating to work in various fields.

Specific bulletins and catalogs are available on the products listed below and a general 20 page bulletin "Jones Drives for Industry" presents a broad picture of Jones products, engineering services and manufacturing facilities.

W. A. JONES FOUNDRY & MACHINE CO.
4437 Roosevelt Road, Chicago 24, Illinois

JUST ASK FOR BULLETIN NO. 80 ➡



• These illustrations show application of Jones drives to solve a wide range of industrial power transmission problems.

Jones

HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS • CUT AND MOLDED TOOTH GEARS • PULLEYS
ANTI-FRICTION PILLOW BLOCKS • V-BELT SHEAVES • FRICTION CLUTCHES • TRANSMISSION APPLIANCES

Oxygen System

(*Continued from Page* 104)

up heat exchanger is at approximately 18 pounds per square inch average and minus 310° F constitutes the basis for the extremely effective removal of impurities.

By contrast to other type oxygen plants, the air at the corresponding point in the system is at a temperature of approximately minus 270° F, and a pressure of approximately 90 pounds per square inch average. The difference in temperature of about 40° F is of great importance since in these lower temperature ranges the vapor pressure of carbon dioxide and other impurities decreases very rapidly with temperature. The vapor pressure of carbon dioxide, for example, is cut in half for each approximate reduction in temperature of 8° F. Thus the amount of carbon dioxide which can theoretically remain in the air leaving the clean-up heat exchanger of our plant is approximately one five-hundredth the amount which can remain in the air leaving the clean-up heat exchanger of other type systems. Operating experience indicates that other type plants must shut down at regular intervals for deriming.

This process involves shutting down the plant and warming up the equipment so as to remove the accumulated deposits of carbon dioxide which otherwise, after a certain length of time, will foul the fractionating column, reboiler surface, reversing valves, the nozzles of the turboexpander, etc., until the plant becomes inoperable. There has been much speculation about how frequently these shutdowns are required, but the best information indicates that the plant will have to be out of service approximately two days out of every 60. Since these shutdowns are apparently caused by accumulated deposits of carbon dioxide and since our clean-up system reduces the quantity of carbon dioxide by a large ratio over other systems, it should be able to run longer, or for all practical purposes indefinitely, without the plant having to shut down for the same cause. By this means, and as confirmed by the performance of the pilot plant, our plant will not have to shut down for process reasons, and can run indefinitely except for periods of regular maintenance of the rotating machinery.

An accumulator (9) is provided in the air stream between the clean-up heat exchanger system and the main column to balance out the pressure and temperature fluctuations which occur to a slight degree when a heat exchanger is switched. Other type plants must switch the clean-up heat exchangers or regenerators on an average of every two or three minutes. By virtue of the higher air pressure (95 pounds per square inch average, approximately) the surging resulting from switching poses a severe problem. In our system the differential pressure between the two sides of the heat exchanger which are being switched is only a few pounds gage; thus the surge is very slight, and the operation takes place only once every four hours instead of every few minutes. Nevertheless, the accumulator does serve a useful purpose in preventing disturbances on the feed tray during these periods. Also it acts as a safety factor in the removal of acetylene.

High initial and maintenance cost of switching valves common to other systems is minimized in our system. Simple butterfly type valves, which are noted for low maintenance characteristics, are used. These valves are designed for operation only slightly above atmospheric pressure and a few pounds differential. Switching valves on other systems, functioning every few minutes, must be designed for a relatively high pressure and will always have a differential pres-

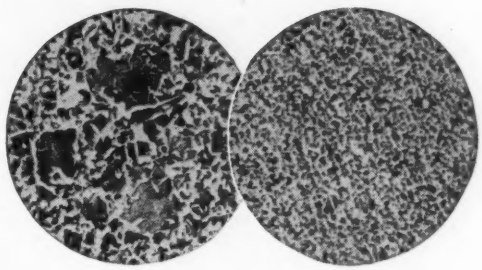
Inside Hardened
Stainless Steel Does It!
R. D. WOOD HYDRAULICALLY BALANCED STRAIGHTWAY STOP VALVE
Just a look inside shows the spindle and the seat are made of hardened stainless steel for greater wear resistance. Entirely suitable for positive shut-off service in hydraulic systems.
The "Why" of Extreme Long Life...
isn't Skin Deep
THREE-WAY BALANCED SPINDLE TYPE VALVE
Look below the surface, the seating elements are of hardened stainless steel . . . to resist wear, corrosion and erosion to an incredible degree. For high pressure service . . . easily operated.
Ask us to send you the inside story of these high pressure valves...write for latest Valve Data Sheets.
HYDRAULIC PRESSES AND VALVES
INTENSIFIERS
EST. 1803
R.D. Wood Company

YOU CAN DEPEND ON

VANADIUM

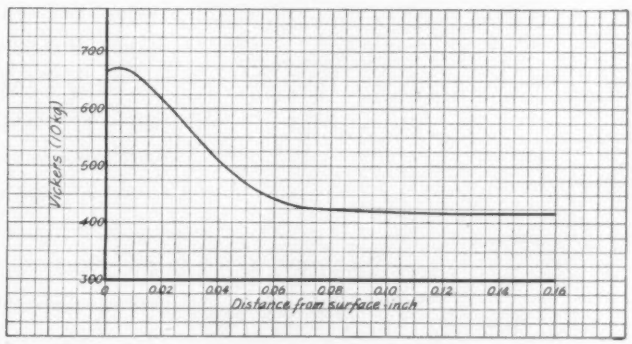
to give you grain size control, high performance, and ease of processing

GRAIN SIZE is refined by the addition of vanadium, the balance between strength and toughness is improved, and greater uniformity is promoted between transverse and longitudinal properties.



0.34 C 0.34 C, 0.20 V

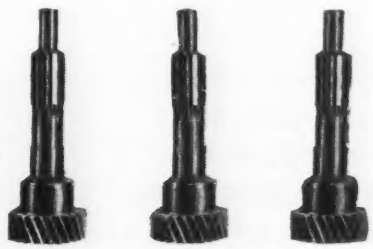
HIGH PERFORMANCE follows the use of vanadium in constructional steels. In carburized parts, for example, the well-integrated bonding between case and core, inherent in vanadium carburizing steels, assures excellent shock-resisting properties and maximum service life.



Hardness penetration graph of Chromium-Vanadium A 6120 steel, with a light case (0.80–0.85% carbon) in outer .010 inch

EASE OF PROCESSING—Uniformity of vanadium steels from heat to heat, with easy and uniform response to thermal and mechanical treatments, brings large compensation—savings far over-shadowing differences in initial materials costs.

Our metallurgists will be glad to assist you in the application of vanadium to meet your requirements.



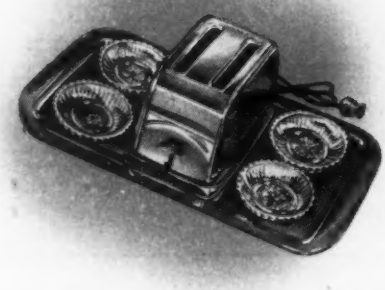
MAKERS OF FERRO-ALLOYS VANCORAM CHEMICALS AND METALS

VANADIUM CORPORATION OF AMERICA

420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

The use of Bright Finish Nickel or Copper Coated ThomaStrip for metal trim on game boards and toy appliances, adds greatly to the eye appeal of these products.

for Eye Appeal



PRE-COATED THOMASTRIP

Pre-coated ThomaStrip is in wide use for decorative and functional purposes. It is the exclusive specification of many manufacturers of durable metal products. The dense, non-porous, crackproof and peelproof coatings of pre-coated ThomaStrip provide lasting protection and appearance. Any temper, as desired in cold rolled strip steel, can be obtained. The cost, product and sales advantages are quickly recognized on test.

ELECTRO-COATED ZINC,
COPPER, NICKEL, AND BRASS
...HOT DIPPED TIN AND SOLDER
LACQUER COATED IN COLORS...
UNCOATED PRECISION STRIP...
CARBON AND ALLOY SPECIALTIES

Thomas Strip
COLD ROLLED STRIP STEEL
REG. U. S. PAT. OFF.

THE THOMAS STEEL CO. • WARREN, OHIO
COLD ROLLED STRIP STEEL SPECIALISTS

sure of 60 pounds per square inch or more.

The air leaving the equalizer or accumulator enters the main column (12) at the appropriate tray.

Essentially pure liquid nitrogen is supplied to the main column as reflux. The quantity is controlled to effect the most economic separation of oxygen from the air charged. The overhead gas from the top of the main column will be at a few pounds gage pressure and at a temperature of approximately minus 318° F, and a purity of approximately 99.5 per cent. A portion of this nitrogen is used in the clean-up heat exchanger to pre-cool the air. Another portion passes through heat exchanger (14), which is a combination reflux cooler and high-pressure nitrogen exchanger. This heat exchanger warms up the nitrogen a few degrees and in so doing, subcools the reflux to minimize flashing before it enters the main column. The nitrogen exchanger section provides a means of cooling high pressure nitrogen to liquefaction temperature. The low pressure nitrogen leaving this heat exchanger passes into another gas-to-gas heat exchanger (16), is warmed up to approximately 60° F, and joins with the nitrogen which is under the same conditions of temperature and pressure leaving the clean-up heat exchanger. A portion of this high-purity dry nitrogen stream is delivered as useful product. The remainder is recycled to the process for making reflux and refrigeration. This portion passes downward into the suction of the nitrogen compressor (19).

The nitrogen compressor is the principal user of power. It is an Elliott multi-stage centrifugal compressor, either turbine or electric driven, with a conventional inter and aftercooler. The nitrogen gas is compressed to approximately 93 pounds per square inch average. This main compressor always operates on clean dry nitrogen gas, and accordingly, will be favored from the standpoint of minimizing maintenance cost. The maximum plant flexibility can be obtained by steam turbine drive since the speed may be varied so as to increase or decrease the amount of refrigeration and reflux to suit optimum requirements of the plant.

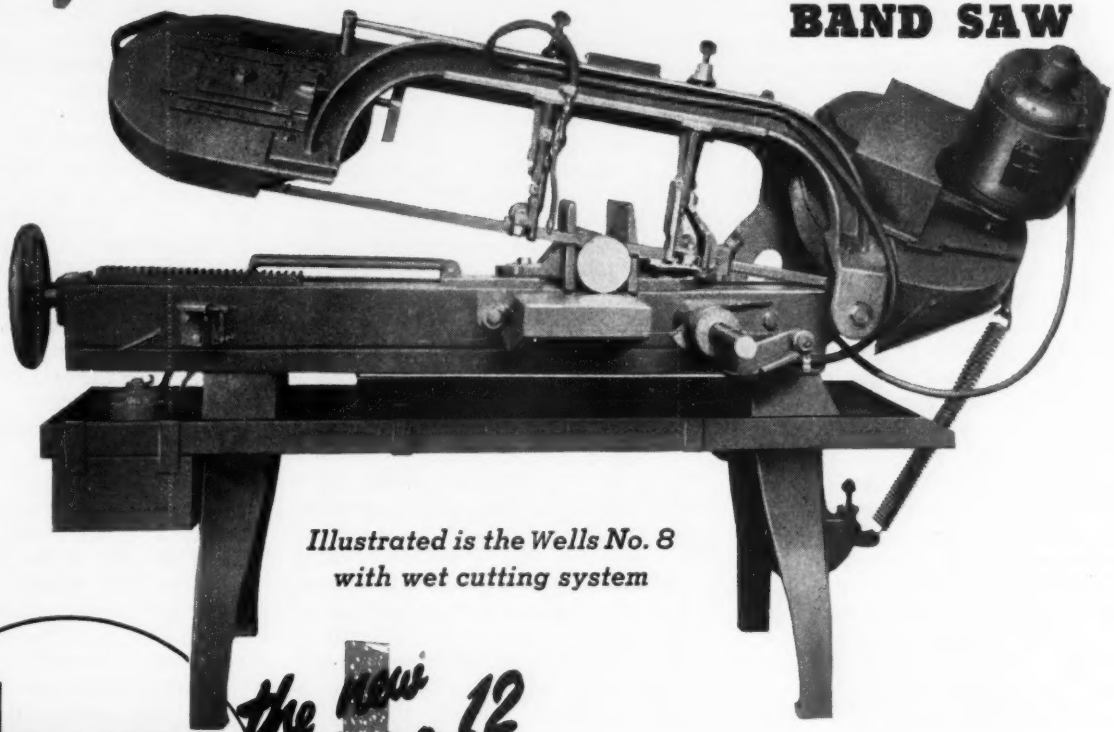
The compressed nitrogen stream leaving the aftercooler is split into three streams, one through each of exchangers (16, 17 and 18). The bulk of the flow is through exchanger (16) in which heat is exchanged against the low-pressure cold nitrogen leaving the top of the fractionating column and exchanger (14). This high-pressure, low-pressure nitrogen heat exchanger is simply a "boot-

there is

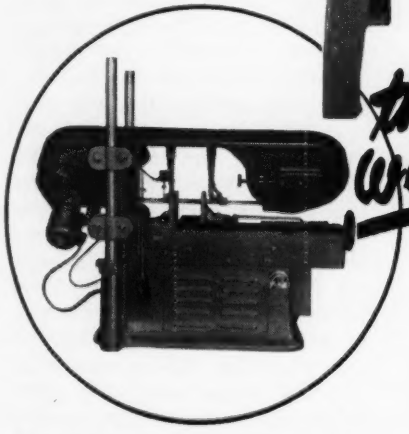
no Lost Time

when you cut with a

WELLS METAL CUTTING BAND SAW



Illustrated is the Wells No. 8 with wet cutting system



the new Wells no 12

The revolutionary new Wells No. 12 features an automatic hydraulically controlled cutting cycle and controlled blade pressure. It will handle rectangular shapes up to 12″ x 16″ and rounds to 12¾″ O.D. It operates at selective speeds of 60, 90 and 150 feet per minute.

You'll get the job done faster with a Wells Band Saw because the cutting action is continuous. There is no wasted motion. Service records in hundreds of leading plants prove that Well Saws reduce cutting time, yet they are versatile and economical. Ask your dealer for a demonstration or write direct.

Specifications—Wells No. 8

CAPACITY:	
Rectangular	8″ x 16″
Special Guides	5″ x 24″
Rounds	8″ O. D.
MOTOR	½ H.P., A.C. or D.C.
SPEEDS	Selective; 60, 90, 130 feet per minute
WEIGHT	Approximately 665 pounds

See the Wells saws in action in Booth 1661 at the Metal Show

Wells SAWS

Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION

1515 FILLMORE ST., THREE RIVERS, MICHIGAN

strap" device for the purpose of raising the temperature level of the low-pressure cold nitrogen gas to a point where it can be conveniently handled in a compressor, then putting the cold back into the high-pressure stream.

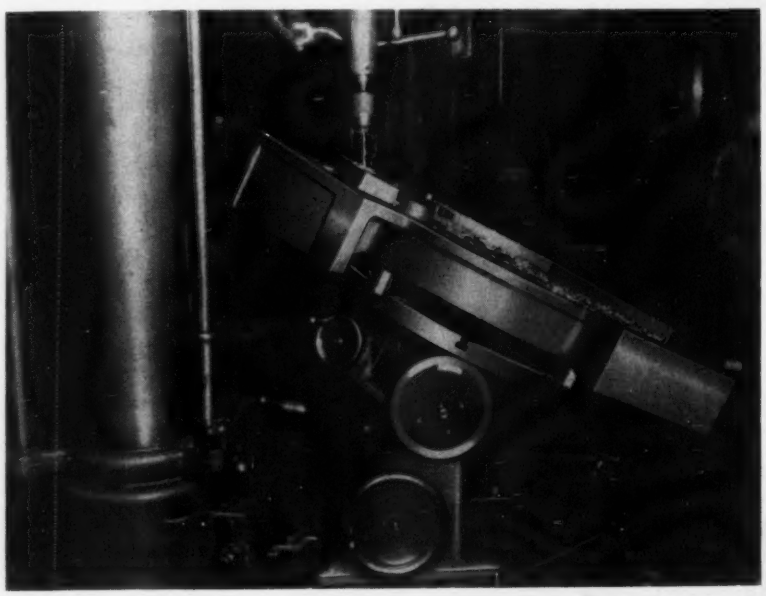
A sufficient quantity of nitrogen leaving exchanger (16) passes through the turbo-expander (15) as required to produce the entire amount of refrigeration for the plant. The temperature to the expander is approximately minus 253° F, leaving at approximately minus 318° F. Energy from the expander drives an integral centrifugal blower which parallels and correspondingly reduces the power required by the charging air blower. It has been confirmed by the operation of the pilot plant, that a deficiency of refrigeration will always reflect in a lowering of the oxygen liquid level in the reboiler of the main column and that a surplus of refrigeration will reflect in an increase of this level. This relationship is utilized to control the flow into the expander by means of a liquid level controller in such a manner that the operation of the expander becomes completely automatic and will adjust itself to changes in plant demand. The expander discharge joins with the stream of cold, low-pressure nitrogen coming from the top of the main fractionating column.

The remainder of the high-pressure nitrogen stream leaving exchanger (16), which is not diverted into the expander, passes down through the nitrogen exchanger section of heat exchanger (14) and joins with the cold high-pressure nitrogen streams coming from the exchangers (17) and (18). The combined streams then enter the nitrogen sides of the reboilers of the main and high-purity columns. At this point the nitrogen is liquefied by condensing against the liquid oxygen on the other side of the reboiler tubes. This provides the heat to boil off the oxygen products and to provide vapor loading for the columns. The liquid nitrogen is controlled by a liquid-level controller and passes up to the top of the main column as liquid nitrogen reflux. No pump is required since the top column pressure is always considerably less than the pressure in the nitrogen side of the reboiler. Quantity of reflux may be varied simply by increasing or decreasing the speed of the nitrogen compressor. This function is entirely independent of the amount of air charged to the system. It is this separate control over the making of nitrogen reflux and the supply of refrigeration that gives our system its extremely high percentage of oxygen recovery and a wide latitude in operational flexibility. The quantity of liquid nitrogen required for this distillation can be related to a temperature difference between the top of the column and a point approximately five trays further down. This phenomenon can be utilized by means of a temperature difference controller to control the speed of the turbine driving the nitrogen compressor so that under any condition of operation of the plant the amount of liquid nitrogen supplied as reflux will always be the optimum quantity equivalent to the lowest total horsepower per unit of useful product.

Distillation takes place in the column and results in liquid oxygen collecting in the reboiler at a purity corresponding to the purity of the principal oxygen product, which for the case being described is 95 per cent. The gaseous oxygen product is taken off at approximately 5 pounds per square inch gravity and the corresponding saturation temperature and warmed up to room temperature through heat exchanger (17). Thus the cold from the oxygen product is returned to the system via the high-pressure nitrogen stream.

Purity of the oxygen product bears a definite relationship to the temperature distribution between the liquid oxygen in the reboiler and a point in the column approximately five trays higher which can be utilized to control the oxygen purity either by regulating the valve on the oxygen product stream or by controlling the speed of the turbine which drives the air charging blower.

The system can make both high-purity and low-purity oxygen simultaneously. A small stripper column (13) is situated at a level beneath the main column in such a manner that 95 per cent purity liquid oxygen feeds as overhead to the top of the high-purity column. The overhead gas from this column will be essentially 95 per cent purity gaseous oxygen and simply joins with the low purity gaseous oxygen stream. The high-purity oxygen product is taken off above the liquid level of the oxygen in the reboiler of the high-purity column and gives up its cold by exchange against some of the high-pressure gaseous nitrogen from the nitrogen compressor through exchanger (18), and is delivered at essentially room temperature as the high-purity product. The nitrogen side of the reboiler of the high-purity column parallels the nitrogen side of the reboiler of the main column. The condensing of nitrogen in this reboiler provides the heat to boil off the high-purity oxygen product and the vapor loading for the operation of the column. The liquid nitrogen condensed in the reboiler flows by its own pressure head and joins with the liquid nitrogen going into the top of the main column. In this



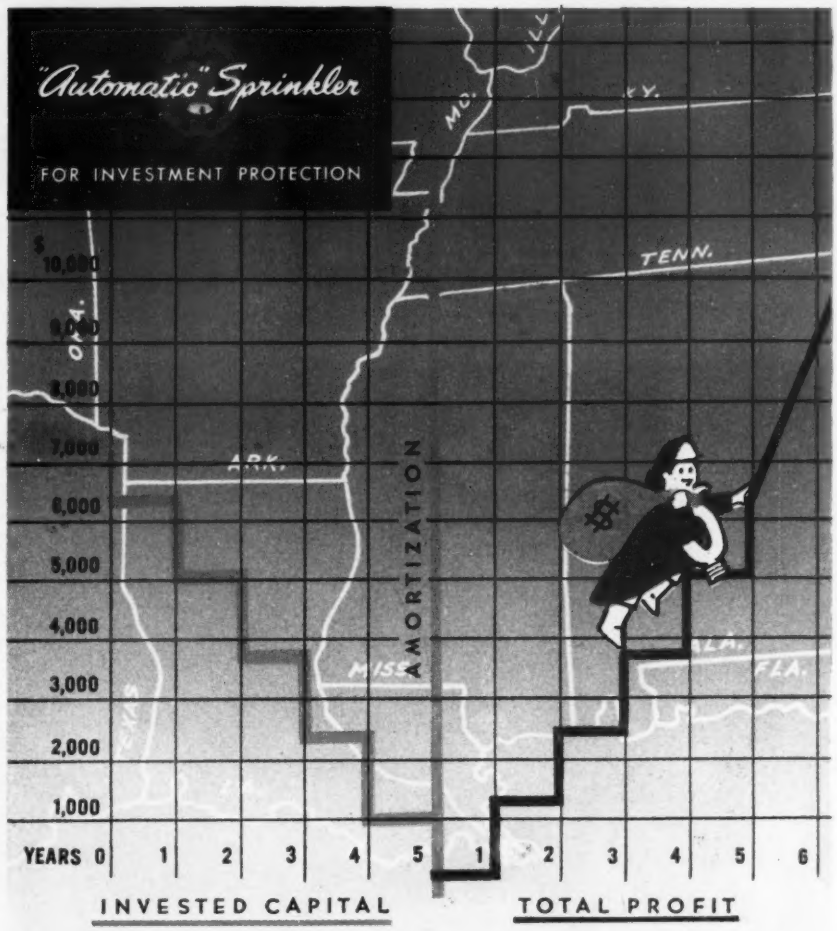
ANGLE BORING: Faced with the task of boring twenty ½-inch holes at a compound angle in a fabricated base 42 inches square, 8 inches thick and weighing 865 pounds, a Michigan manufacturer mounted the base on a standard 24-inch Rotab, made by Machine Products Co., Detroit, under a radial drill press. Initial setup is made on face plate and fixture is tilted to proper angle. Work is then indexed for various holes through worm mechanism by reading graduations on vernier dial

manner the high-purity column can deliver any quantity of high-purity oxygen within the design limits and virtually floats on the system with the main column.

This combination of functions in our cycle makes it possible to obtain an unusual degree of flexibility in operation. The plant can deliver any quantity of product required over a wide range of variable conditions within the design limits of the plant while maintaining constant purity irrespective of weather conditions, seasons of the year, and other factors which effect the performance of a low-temperature process. The various functions will automatically adjust themselves to the lowest horsepower per unit of oxygen product. The plant can operate down to approximately two-thirds of full capacity without any sacrifice of horsepower per unit of oxygen product.

To illustrate how the controls on the system will respond, suppose the plant is operating at reduced capacity and more oxygen is demanded. The oxygen product valve will open and more gas immediately is withdrawn. While the plant is adjusting itself the need will be satisfied by working on the reserve of liquid oxygen stored in the reboiler. The tendency will be to slightly drop the purity. This indication will be picked up on the temperature difference controller which will increase the speed of the air-charging blower. This increases the flow of conditioned air charged to the main column and immediately requires more liquid nitrogen reflux to effect a distillation. Temperature difference controller at the top of the column picks up the signal that the plant is deficient in reflux and speeds up the nitrogen compressor. The plant will again come into balance for the new operating condition in approximately 30 minutes. When reducing in capacity the reverse procedure will take place.

There is a long history of explosions in oxygen plants resulting from the accumulation of acetylene from the air, which is almost always present in minute quantities, and concentrates in the liquid oxygen in the reboiler of the fractionating column. In other type oxygen plants the air can only be precooled to a saturation temperature corresponding to the air pressure and this is not low enough to remove any acetylene while the air passes through the clean-up heat exchanger or regenerator with the result that the acetylene works its way ultimately into the column. A concentration of from 5 to 6 parts per million of acetylene in liquid oxygen is said to be dangerous, and according to the best opinions is the cause of



South-Central States . . Where "Automatic" Sprinklers Convert Existing Expense into Capital Assets

You no doubt are fully aware of the advantages of "Automatic" Sprinklers as a basis of true fire protection. But, what of the element of cost? That's an important decision made, for the most part, by executives, wise in the field of finance. Those are the individuals to whom this message is directed.

Adequate fire protection must always receive primary consideration, but, do you know that approved "Automatic" Sprinkler systems provide, in addition to security, savings of upwards to 90% in insurance premiums? You don't have to be a wizard with figures to recognize the substantial percentage of return that's realized on your initial investment. That's the way "Automatic" Sprinkler systems are paid for. **That's the proved method of converting an existing expense into a capital asset.**

Your nearest "Automatic" Sprinkler representative will furnish complete details and gladly prepare a fire protection analysis for your consideration. You'll then be able to see at first hand why "Automatic" Sprinklers are recognized as *an important investment today . . . perhaps welcomed protection tomorrow.*

"Automatic" Sprinkler

FIRST IN FIRE PROTECTION

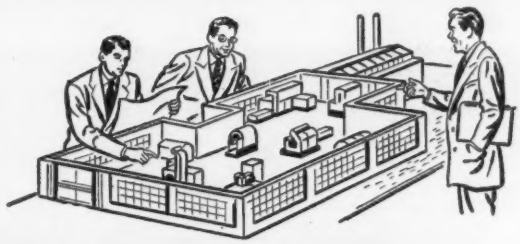
DEVELOPMENT · ENGINEERING MANUFACTURE · INSTALLATION

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA

YOUNGSTOWN 1, OHIO

OFFICES IN PRINCIPAL CITIES OF NORTH and SOUTH AMERICA

Confidence



WITH ITS SLEEVES ROLLED UP!

STRAIGHT AND STALWART, every factory stack is a towering symbol of man's faith in the future . . . industry's confidence in its ability to create and to expand production for better living and a richer world.

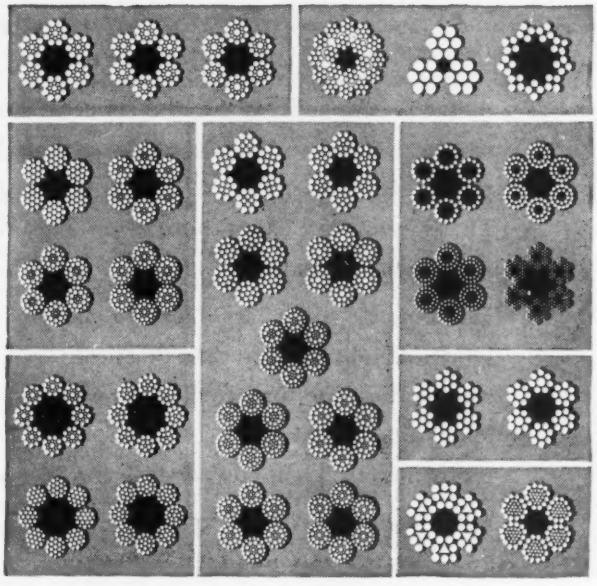
With confidence like that, Roebling has pioneered in developing and making an extraordinary range of products indispensable to industry. And the confidence that its products and engineering skill have earned in every industrial field is one of Roebling's most valued assets. Every Roebling employee is striving to safeguard that confidence by making products and rendering services that are of maximum utility to you.

YOU CAN'T GO WRONG WITH THE RIGHT WIRE ROPE

EVERY TYPE of Roebling Wire Rope is right for certain service. But that's not enough . . . the important thing is that you choose the one rope that's *right* for your own job . . . the rope with the right balance of strength, flexibility, fatigue and abrasion resistance to give real economy over a long period of use.

Your Roebling Field Man will gladly study your requirements, and you can have full confidence that the rope he recommends will give you top returns per dollar. Whatever type it is, preformed or non-preformed, it will have behind it Roebling's unequalled experience in research, development and manufacturing the finest wire products that can be made.

Call or wire the nearest Roebling branch office.



JOHN A. ROEBLING'S SONS COMPANY

TRENTON 2, NEW JERSEY

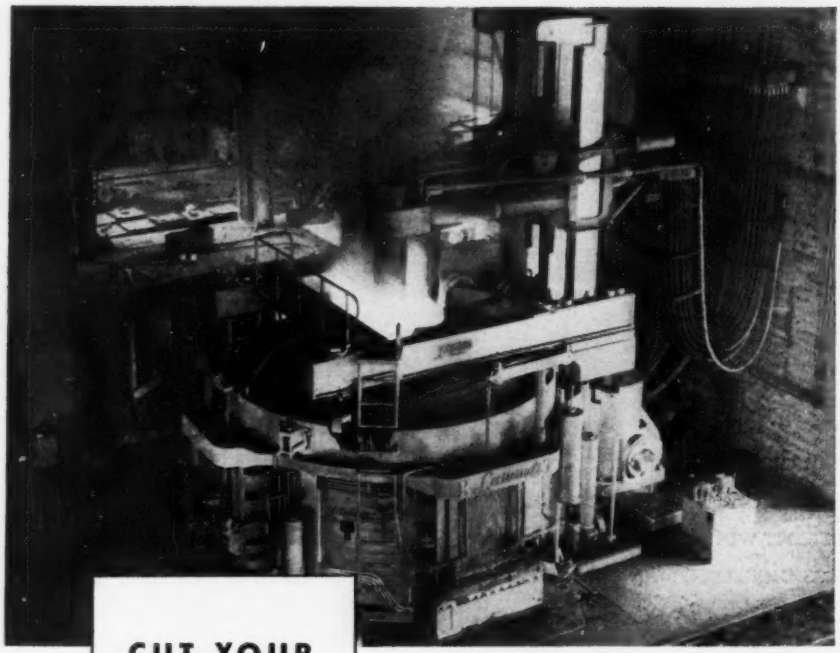
Branches and Warehouses in Principal Cities

★ *WIRE ROPE AND STRAND* ★ *FITTINGS* ★ *SLINGS* ★ *SUSPENSION BRIDGES AND CABLES* ★ *AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS* ★ *AERIAL WIRE ROPE SYSTEMS* ★ *ELECTRICAL WIRE AND CABLE* ★ *SKI LIFTS* ★ *HARD ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL* ★ *SCREEN HARDWARE AND INDUSTRIAL WIRE CLOTH* ★ *LAWN MOWERS*

ROEBLING

A CENTURY OF CONFIDENCE

JAR ROEBLING



CUT YOUR
time
LOSS

with top-charging

MOORE RAPID
Lectromelt
FURNACES

As far as cost and out-put are concerned, non-productive time is waste time—and the periods consumed in recharging a furnace are certainly non-productive. That's why you save—both time and money—with Lectromelt furnaces.

Lectromelt's top charge feature makes recharging a quick, simple process that drastically reduces furnace down time. The furnace roof is raised and swung aside hydraulically, the charge is dropped in and the roof repositioned. Then you're ready for "power on".

Lectromelt furnaces are available in sizes ranging from 100 tons to 250 pounds. Write today for complete details.

MANUFACTURED IN

CANADA	Lectromelt Furnaces of Canada, Ltd., Toronto 2
ENGLAND, SWEDEN, AUSTRALIA	Birlec, Ltd., Birmingham, England
FRANCE	Stein et Roubaix, Paris
BELGIUM	S. A. Belge Stein et Roubaix, Bressoux-Liege
SPAIN	General Electrica Espanola, Bilbao
ITALY	Forni Stein, Genoa

PITTSBURGH LECTROMELT FURNACE CORPORATION

Pittsburgh . . 30, . . Penna.

the explosions which occur. There are several methods proposed for minimizing this problem, but the mental hazard always exists, and the methods which must be used are costly from the standpoint of power and depend to a great extent on the human element. Analysis of the quantity of acetylene in the liquid oxygen must be frequently determined so that by blowing down, the concentration may be kept to within safe limits.

In our system, by virtue of starting off at a lower pressure, air is cooled to a considerably lower saturation temperature. It has been confirmed by operation of the pilot plant that acetylene is actually frozen out on the clean-up heat exchanger surface in exactly the same manner as the carbon dioxide and water vapor. The air leaving the clean-up heat exchanger is saturated with acetylene under the conditions of temperature and pressure. This quantity is considerably less than the quantity which the gaseous oxygen product can always remove continuously from the system with the result that a dangerous concentration cannot build up in the liquid oxygen in the reboiler. As a further safeguard, the accumulator (11) is filled with silica gel so as to take advantage of the excellent absorptive ability of this material for acetylene at low temperature, should the operators through some maloperation permit the temperature of the air leaving the clean-up heat exchanger system to rise above the level required for acetylene removal.

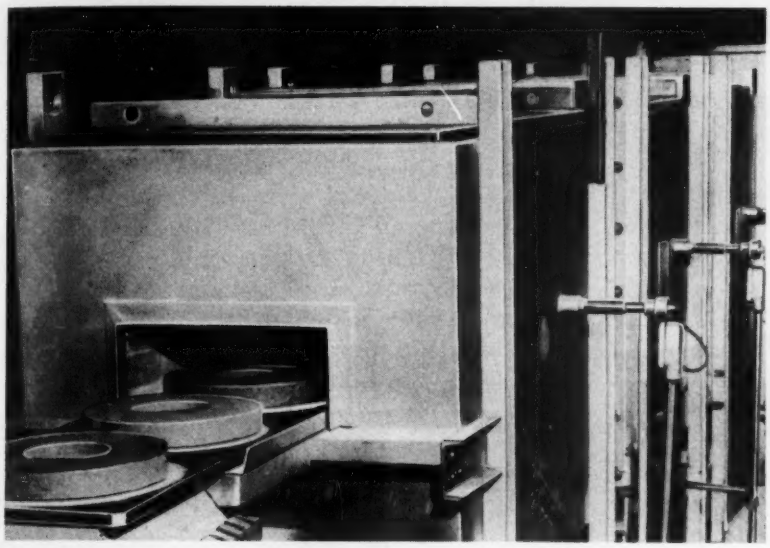
Size of the accumulator is such that it will adequately take care of the acetylene which will reach that point for at least six months without attention. The accumulator is installed with a by-pass system so that every six months, without otherwise disturbing the operation of the plant, it may be removed from service and purged with warm dry effluent nitrogen. This is a "fool proof" combination of functions to remove acetylene, which has been thoroughly demonstrated in the operation of the pilot plant. After nine weeks of continuous operation analysis showed no traces of acetylene in the liquid oxygen in the reboiler, although traces were found in the entering air and other parts of the system ahead of the main column.

—o—

Ampco Metal Inc., Milwaukee, is now offering to send users three sample rods of Ampco-Trode 10 aluminum bronze electrodes so each welder can prove to himself the versatility of this rod developed to weld cast iron, iron-copper and nickel base alloys as well as dissimilar metals.

Continuous Tunnel Kiln

Improves Quality of Abrasive Wheels



Discharge end of continuous tunnel kiln showing portion of control equipment and thermocouples which aid in maintaining accurate temperature control

MORE accurate zone firing methods for scientific control of the firing cycle in manufacture of grinding wheels are embodied in a continuous tunnel kiln developed by research personnel of Carborundum Co., Niagara Falls, N. Y. Improvements in product quality have been combined with more efficient production techniques, resulting in greatly increased uniformity in the grinding wheels produced in the new kiln. In addition, greater latitude is provided for development and selection of bonds.

Full scientific control of operations employed in manufacturing grinding wheels eliminates many of the factors of human error present in former methods of manufacture. New standards in production efficiency are made possible by time savings in the firing cycle. Firing cycles have been reduced to one-third and as little as one-twelfth of that normally required in methods used with standard kiln equipment.

Grinding wheel manufacturing line is organized on a basis whereby mixing, molding, drying, firing, finishing, packing and shipping operations follow in an orderly sequence. This new type of production line permits much closer control of each operation, enabling maintenance of new standards of high quality.

Pilot Plant Demonstrates Coal Separation Process

Demonstration on a commercial scale of the coal separation process to be used in the $10 million coal cleaning plant being built by F. H. McGraw & Co., New York, for Jones & Laughlin Steel Corp. at East Fredericktown, Pa., was made recently in a pilot plant set up by Nelson L. Davis Co. in Chicago.

The equipment tested at the Chicago plant will be moved to the Pennsylvania facility for production use early next year.

With reserves of metallurgical coal having free impurities such as slate and sulphur rapidly dwindling, development of methods for separating the high quality coal from other coal in which slate and sulphur are physically or chemically combined has become necessary. Such a process by which suitable coal floats and unsuitable coal sinks is accomplished in a vessel invented by the Davis company, and the flotation medium is recovered by a process controlled by American Cyanamid Co., New York.

In the pilot plant two processing units handled 500 tons of coal an hour. J&L's plant will process run-of-the-mine coal at the rate of 2400 tons an hour.

Diesel Engines, Scrapers Feature New Production

Beyond the design and research stage and proved in performance by proving ground and customer tests, according to Caterpillar Tractor Co., Peoria, Ill., are ten new additions to the company's production. A 500 horsepower diesel engine and two-wheeled self-propelled scrapers are the latest results of the development and expansion program undertaken by the company. These products will enter volume production as quickly as the current expansion of manufacturing facilities at the Peoria plant will permit.

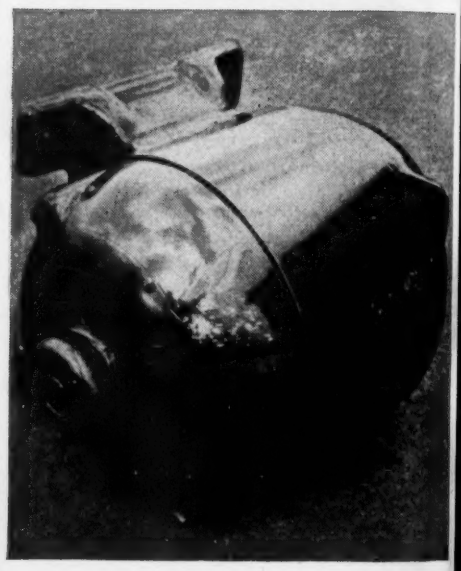
Scheduled for production are a two-wheeled diesel tractor-scraper unit, a four-wheeled diesel tractor-wagon unit, two additional scrapers, four diesel engines for use as industrial power units, electric sets and completely marined engines and a fifth new diesel engine integral with the wheel-type tractors. The new diesel engines are of 225, 267, 333, 400 and 500 horsepower.

Each of the earthmoving units has constant mesh spur and helical gear transmission, pump lubricated, and a 16-inch diameter double-plate clutch with semi-metallic friction surfaces, foot operated. Each has a full floating, 4½-inch diameter rear axle. Positive hydraulic follow-up steering 90 degrees each way, is provided. Bottom dump W20 wagon has a struck capacity of 14 cubic yards and a heaped capacity of 22 yards. The No. 40 and 90 scrapers have struck capacities of 3.6 and 21.2 cubic yards and heaped capacities of 4.5 and 27 cubic yards, respectively.

—o—

Black Industries, Cleveland, has designed and built a new machine which provides constant tension and constant velocity on a web of paper during printing. Similar machines, using the same control principle, are expected to find wide application in the paper, textile, plastic, leather and rubber industries and in the metal fabricating field where coiled ferrous or nonferrous metals are used.

Life-Line.



SMASHING IMPACT caused by dropping this Life-Line motor onto hard concrete pavement failed to do more than mar the finish—a shock test no cast iron can stand.

TERRIFIC PUNISHMENT PROVES STRENGTH OF INDUSTRY'S NEW ALL-STEEL MOTOR!

Over a quarter of a million now in service set best performance record in 58 years of manufacture

Motors seldom have to withstand dropping onto concrete pavement—but they do meet constant stresses and unexpected shocks on almost any job in industry.

The fact that Westinghouse Life-Line motors can withstand such extreme examples of abuse is one of the reasons for the startling records of the more than a quarter million Life-Lines now in service.

The performance record of these units has been six times better than that of any other motor design built by Westinghouse in its 58 years of motor manufacture.

Life-Line's heavy steel construction is one of the benefits that has come to industry out of war experience, when motors built for use on Naval vessels proved the much greater shock resistance of steel over cast iron.

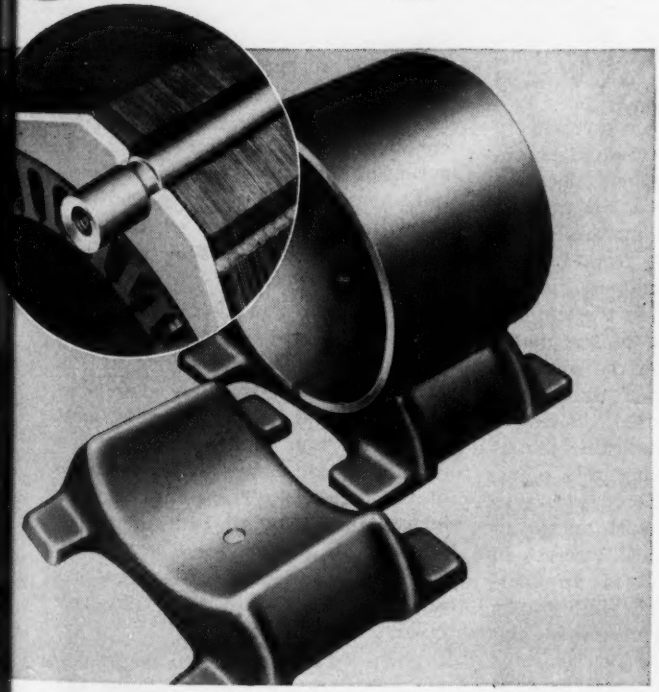
The heavy steel "barrel" frame and "bridge-truss" foot construction has given the motor a rigid, yet resilient structure; at the same time, it has saved as much as 35% in space requirements over other methods of construction. The streamline of the Life-Line blends smoothly with modern machinery.

Get the full facts on Life-Line—its pre-lubricated bearings—its new electrical strength—and the reduced space and weight requirements—they're *all important* gains for your equipment.

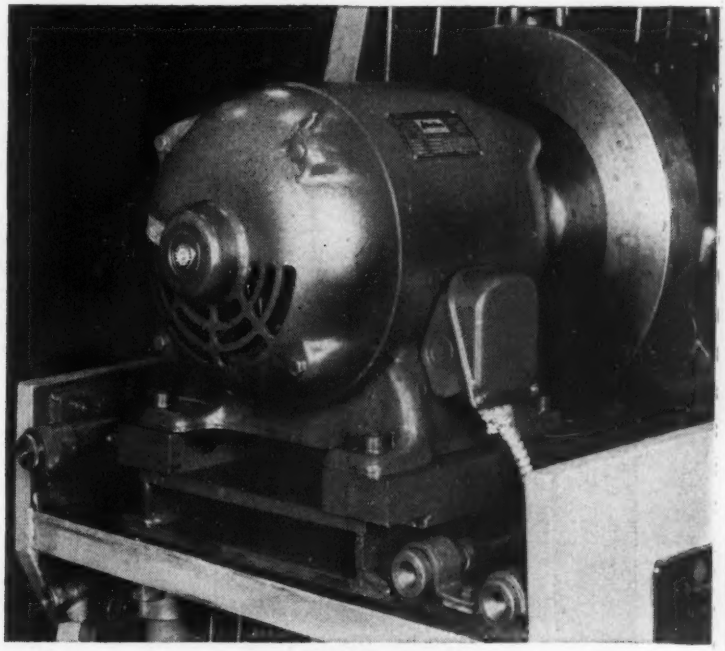
Immediate delivery on standard and near-standard Life-Line motors, from 1 to 15 hp, in dripproof, splashproof and totally-enclosed types; short delivery available on the specials in these frame sizes. The Life-Line design is rapidly being carried through the larger sizes. Check your nearest Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21454

Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

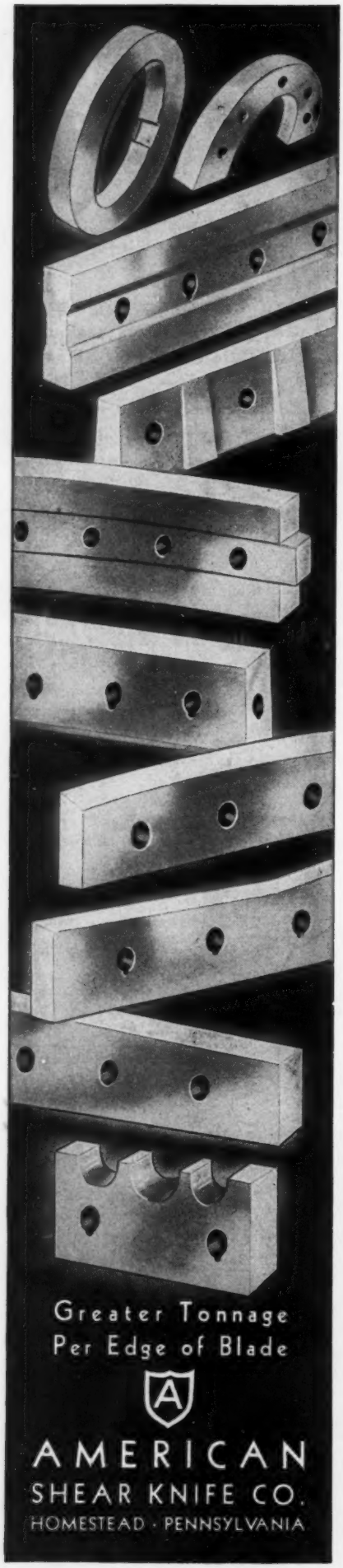
Life-Line motors



STEEL STRENGTH starts with heavy rolled plate which forms Life-Line motor frame. Brackets and feet are heavy pressed steel. Clamping bars and plates, bearing hubs and even conduit boxes in Life-Line motors, are made of sturdy steel.



TOUGH JOBS—the shock loads of punch presses, drop hammers and other strenuous machine tool applications; these are places where Life-Line's greater resistance to shock means longer life and more trouble-free operation.



New Books

Welding Textbook Shows Procedures and Projects

Elementary and Applied Welding, by Herbert P. Rigsby and Chris Harold Groneman; published by Bruce Publishing Co., 540 N. Milwaukee St., Milwaukee 1; fabricoid, 151 pages, 8¾ x 5½-inches; $2.00.

Authored by members of the faculty of Agricultural & Mechanical College of Texas, this book contains material especially adaptable to the beginning student in both oxyacetylene and arc welding. Basic procedures are explained and fully illustrated so that the learner is guided methodically from the most simple to the more complicated processes in welding technique.

The first third of the book is devoted to the fundamental aspects of welding, including the equipment required, safety measures to be followed, metals used, and types of welds, while the remainder of the book is occupied with projects for construction by the welding student. These projects are fully illustrated and list materials and equipment and the step-by-step procedure to be used.

Comprehensive Book on Telemetering Published

Principles and Methods of Telemetering, by Perry A Borden and Gustave M. Thynell; cloth, 230 pages, 9¼ x 6-inches; published by Reinhold Publishing Corp., 330 W. 42nd St., New York, for $4.50.

This ambitious book on a relatively new science and art—that of reproducing at a convenient location measurements made at a remote point—represents, the authors state, a compilation of data from telemetering instrument makers rather than an original work on the subject. They admit that little of the material presented could not be obtained by the reader himself from the sources they have used; however, they have done an admirable job of digesting and condensing this material, and present it as engineers in the telemetering field with an eye to the features of technical interest in each instrument discussed. In addition to a profusion of photographs and diagrams of the instruments and their circuits, the book also contains a list of important patents in telemetering and allied fields as well as a bibliography covering periodicals, books and reports on the subject.

One of the aims has been to mention only briefly those telemetering systems which have long been known and widely discussed in previous texts and handbooks so as to confine most of this book's material to those instruments and systems which have not previously been widely publicized.

Contributing information and other material to the authors were the following companies: Allis-Chalmers Mfg. Co., Milwaukee; American Telephone & Telegraph Co., New York; Bailey Meter Co., Cleveland; Jas. G. Biddle Co., Philadelphia; Bristol Co., Waterbury, Conn.; Builders Iron Foundry Co., Providence, R. I.; Control Corp., Minneapolis; Esterline-Angus Co., Indianapolis; Fairchild Camera & Instrument Corp., Jamaica, N. Y.; General Electric Co., Schenectady, N. Y.; Leeds & Northrup Co., Philadelphia; Leupold & Stevens Instruments, Portland, Oreg.; R. H. Nichols Ltd., Toronto, Ont.; Pneumercator Co. Inc., New York; Republic Flow Meters Co., Chicago; Wallace & Tiernan Products, Belleville, N. J.; and Westinghouse Electric Corp., Pittsburgh.

Enlarged Metals Handbook Published by ASM

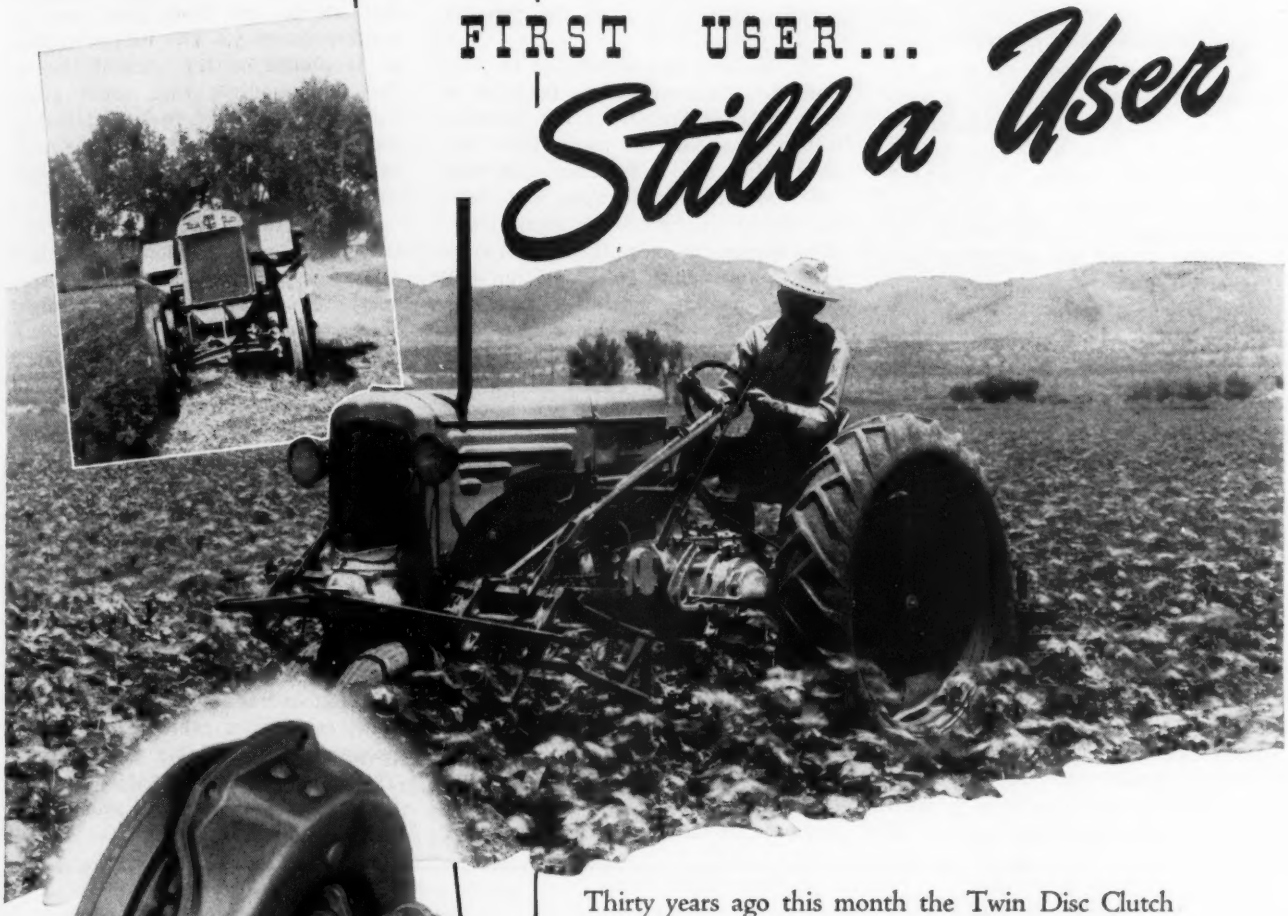
Metals Handbook (1948 Edition), edited by Taylor Lyman; cloth, 1444 pages, 8½ x 11 inches; published by American Society for Metals, Cleveland, for $15.00; free to members in exchange for 1939 edition.

Superseding the 1939 edition, the new handbook has been greatly enlarged and completely revised. It now contains much matter which was restricted when the 1939 edition was reprinted during the war years. New committees were organized upon cessation of the war in 1945, their function being to gather together the latest material bearing on the various branches of metallurgy covered by the handbook.

On the flyleaf inside the front cover is a condensed table of contents listing all principal sections of the handbook. Under the four main divisions (general section, ferrous metals, nonferrous metals, constitution of alloys) are listed the 37 sections of the handbook. The complete table of contents lists all of the articles between its covers, some 803 in all. Also listed on the flyleaf are important reference tables for ready reference.

Liberal use is made of charts, photomicrographs, graphs, tables and photographs. The advertising section is sectionalized for convenience in use, the divisions being made by important fields of metal producing and metal working industries. Coupons

FIRST USER... Still a User



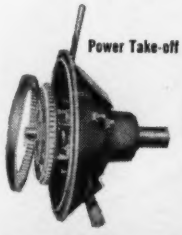
Top—The Twin City 12-20 tractor, one of the first two engineered tractors on the American market, appeared in 1918.

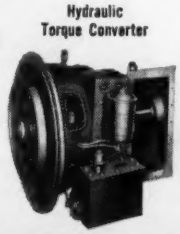
Center—Minneapolis-Moline Power Implement Company's Universal R tractor and cultivator.

Below—Twin Disc Farm Tractor Clutch.

For other examples of power transmission *then* and *now*, write for the "30th Anniversary Issue" of *Production Road*.

Thirty years ago this month the Twin Disc Clutch Company was incorporated to produce *better* clutches for farm tractors. The first units were used in equipment of the Minneapolis Steel and Machinery Company—now Minneapolis-Moline Power Implement Company. Throughout three decades, Minneapolis-Moline has continued to use Twin Disc units in its farm machinery. During these thirty years, leading manufacturers of equipment for the logging, petroleum, construction, marine, locomotive, and machine tool industries have also found Twin Disc Clutches and Hydraulic Drives the most efficient power transmission units. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).





TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U. S. PAT. OFF.

JUDGE TWIN DISC BY THE COMPANIES IT KEEPS

are provided for requesting manufacturers' literature. The topical index contains three principal types of entry: Materials (chiefly metals and alloys), processes and properties.

Nearly all of the specific data for nonferrous metals and alloys is presented according to a semitabular arrangement. A guide to the use of the nonferrous data sheets is presented inside the back cover of the handbook, information on the various alloys being found by following key numbers.

English Book Covers Metal Spraying Process

Metal Spraying and Sprayed Metal, third edition, rewritten by W. E. Ballard; cloth, 6½ x 9 inches, 362 pages; published by Charles Griffin & Co. Ltd., London; distributed in United States by American Metallizing Contractors Association, St. Louis.

Need for published information on the latest developments in this field led the author to rewrite this book, originally written by T. H. Turner and Dr. N. Budgen in 1926 and revised by Dr. E. C. Rollason in 1939. The author states in the preface to the third ediiton that while the previous editions were "written by men having a purely scientific interest in metal spraying, this does not apply in the case of the present author who has been connected with the commercial development of the process for 21 years".

Mr. Ballard has attempted to present the material in the book as a help to the operators of the process, using "operator" to mean both the man using the metallizing gun and the manager of the spraying shop. An effort was made to avoid technical terms, the more theoretical considerations being relegated to the sections dealing with the structure and formation of the deposits.

The book, divided into 12 chapters, has 216 illustrations and 61 tables. Among the illustrations are a considerable number of photomicrographs and line drawings. A list of names and a subject index complete the work.

Molybdenum as Alloying Element Described in Book

Molybdenum Steels, Irons, Alloys, by R. S. Archer, J. Z. Briggs and C. M. Loeb Jr.; cloth, 391 pages, 6¼ x 9¼-inches; published by Climax Molybdenum Co., distributed free of charge to metallurgists and others connected with metallurgical industries.

Varied applications of molybdenum as an alloying element are described in the book which covers a wide range of materials from wrought to cast steels and from cast iron to nonferrous alloys. The major emphasis is placed on the presentation of the fundamentals that must guide the engineers, designers and metallurgists in their selection of the most suitable materials for a given application.

Main section headings are: Technical effects of molybdenum, wrought alloy engineering steels, wrought corrosion resistant steels, wrought steels for elevated temperature service, tool steels, steel castings, cast iron, special purpose and nonferrous alloys. Recent developments, such as the gas turbine steels and alloys, is included. Information on specialty applications such as exhaust valves, elevated temperature springs, high permeability alloys, contact materials, grid wires and prosthetic alloys, has been compiled.

Appendices include data on standard compositions of American, British and French engineering steels, working stresses from the boiler code, conversion tables and physical properties of metallic molybdenum. The book contains 91 tables and 187 illustrations, most of which are charts and graphs.

A Complete Warehouse Service for...
SHEETS • PLATES
STRIP • STAINLESS STEEL
TIN PLATE • BARS • SHAPES
WIRE PRODUCTS • ALLOYS
Adequate Stocks!
Prompt Shipment!
Tri-Boro Steel Supply Co., Inc.
133 LINCOLN AVE., NEW YORK 54, NEW YORK • CYPRESS 2-3900
An Affiliate of
CHARLES A. KOONS & CO.
WORLD-WIDE EXPORTERS • NEW YORK • CLEVELAND • SAN FRANCISCO
main office—620 5th AVE., NEW YORK 20
Tri-Boro Steel Supply Co., Inc.

Market Summary

STEEL SUPPLY— Tight supply conditions promise to continue indefinitely into the future with consumers fighting every inch of the way for sufficient tonnage to support operations at current levels.

This is especially true of the near term. For the longer term, however, increased production is expected to gradually ease the situation somewhat, though, at the moment, there is no expectation the gap between supply and demand will be appreciably narrowed for many months to come.

ALLOCATIONS— The outlook for fourth quarter is not as disturbing for the ordinary steel consumer as had been predicted in recent weeks. Quotas will be down from the current quarter in major products, but the overall allocations drain will be less severe than recently anticipated. Indications are fourth quarter steel output increase will more than offset the increased tonnages taken on approved allocations programs compared with fourth quarter last year.

At the same time, despite appeals for allocation assistance by an increasing number of industries, these representing a chain reaction to the already approved programs, it is generally conceded these appeals will have little bearing on distribution in the closing months of the year.

QUOTAS— All steel producers have not yet set up consumer quotas for the entire fourth quarter on some products. However, most of them have their schedules pretty well lined up and in the majority of cases customers have been given a reasonably good idea as to what tonnage they may expect.

Stringency will be most pronounced in plates, light flat-rolled products and pipe. This largely reflects impact of voluntary allocations, the severity of the pinch varying in proportion to each product's importance in the essential industry programs. At the same time, effects of the recent shift from basing point to mill pricing are appearing in bolder relief with the mills placing greater emphasis on requirements of consumers close to their producing plants.

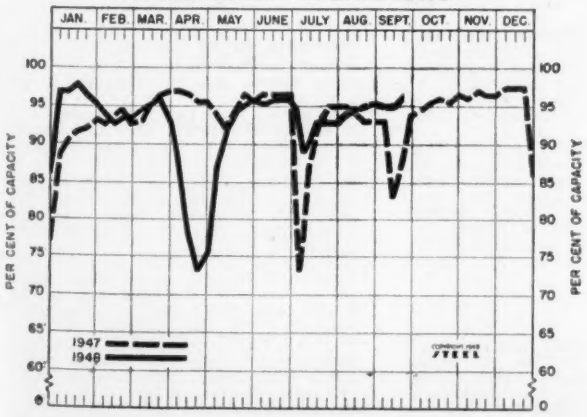
RAW MATERIALS— No appreciable change in pig iron and scrap supply conditions is in prospect. Some domestic iron is moving at prices considerably above the recognized market. Also high prices are being paid on lots of imported iron. In the East the stringency in foundry iron has been intensified by curtailment of shipments by one producer. The cut in quotas is said to amount to about 50 per cent, and is ascribed to the fact the producer has found it necessary to supply more basic iron to its own steelworks.

The situation in scrap is slightly more comfortable though the outlook for the winter months continues threatening. Domestic shipments have been freer lately and substantial tonnages have been coming in from abroad. The better flow appears to be exerting a stabilizing influence on prices.

PRICES— Further adjustments in stainless steel price lists have been made by some producing interests so as to make them more competitive. Otherwise the market is without feature pricewise. Talk still is heard of possible higher prices developing in event production costs continue to rise. Shift from the basing point system of pricing to mill pricing also is a factor which may make for additional price adjustments as the market pattern comes into clearer perspective.

COMPOSITES— Although adjustments are still being made in producers' price schedules, STEEL's composites are unchanged from the preceding week. Finished steel stands at $93.86 against $75.41 a year ago; semifinished steel at $75.75 against $56.80; steelmaking pig iron at $44.19 compared with $36.19, and steelmaking scrap at $43.33 against $37.83.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Sept. 18	Change	Same Week 1947	Same Week 1946
Pittsburgh	94.5	+ 0.5	80.5	97.5
Chicago	96	+ 1.5	92.5	90
Eastern Pa.	93	+ 1	92	81
Youngstown	103	None	92	89
Wheeling	95	+ 5.5	93.5	93.5
Cleveland	90	+ 0.5	92.5	91
Buffalo	104	— 2.5	88.5	90.5
Birmingham	100	None	99	99
New England	83	+ 3	85	95
Cincinnati	102	None	94	81
St. Louis	91.5	None	78	65.5
Detroit	100	None	91	86
Estimated national rate	96	+ 1	87.5	90

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Sept. 18	Sept. 11	Month Ago Aug. 1947	Year Ago Sept. 1947	5 Years Ago Sept. 1943
Finished Steel	$93.86	$93.86	$93.86	$75.41	$56.73
Semifinished Steel	75.75	75.75	75.75	56.80	36.00
Steelmaking Pig Iron	44.19	44.19	44.13	36.14	23.00
Steelmaking Scrap	43.33	43.33	43.33	37.83	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Aug. 1948	4.06642c
July 1948	3.79216c
Aug. 1947	3.46652c
Aug. 1943	2.45773c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. July and August, 1948, figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, wire rods, cents per lb; semifinished (except wire rods) and coke, dollars three months and one year ago. Finished material (except tin plate) and per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Sept. 18, 1948	Aug. 1948	June 1948	Sept. 1947
Steel bars, Pittsburgh mills	3.45c	3.45c	2.875c	2.90c
Steel bars, del. Philadelphia	3.79	3.79	3.365	3.28
Steel bars, Chicago mills	3.35	3.35	2.875	2.90
Shapes, Pittsburgh mills	3.25	3.275	2.775	2.80
Shapes, Chicago mills	3.25	3.25	2.775	2.80
Shapes, del. Philadelphia	3.48	3.48	2.98	2.94
Plates, Pittsburgh mills	3.50	3.50	2.925	2.95
Plates, Chicago mills	3.40	3.40	2.925	2.95
Plates, del. Philadelphia	3.71	3.71	3.21	3.15
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	2.775	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	3.50	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	3.90	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	2.775	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	3.50	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	3.90	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.275	3.05	2.80
Strip, cold-rolled, Pittsburgh mills	4.00	4.25	3.775	3.55
Bright basic, wire, Pittsburgh	4.15	4.325	3.725	3.675
Wire nails, Pittsburgh mills	5.20	5.775	5.125	4.25
Tin plate, per base box, Pitts. dist.	$6.70	$6.80	$6.70	$5.75

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$60.00	$53.57
Slabs, Pittsburgh, Chicago	52.00	52.00	45.00	40.18
Rerolling billets, Pittsburgh	52.00	52.00	45.00	40.18
Wire rod 7/32 to ¼-inch, Pitts. dist.	3.775c	3.775c	3.175c	2.925c

* Nominal.

Pig Iron

	Sept. 18, 1948	Aug. 1948	June 1948	Sept. 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$44.08	$37.83
Basic, Valley	43.00	43.00	39.00	36.00
Basic, eastern del. Philadelphia	46.17	46.17	42.17	38.72
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	43.58	37.33
No. 2 fdry., del. Philadelphia	46.67	46.67	42.67	39.22
No. 2 foundry, Chicago	43.25	43.25	39.00	36.00
No. 2 foundry, Valley	43.50	43.50	39.50	36.50
Southern No. 2 Birmingham	43.38	43.38	39.38	34.88
Southern No. 2 del. Cincinnati	49.09	49.09	45.09	39.75
Malleable, Valley	43.50	43.50	39.50	36.50
Malleable, Chicago	43.50	43.50	39.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	62.00	62.00	58.00	44.00
Ferromanganese, fob cars, Pittsburgh	148.00*	148.00*	151.15	140.25

* F.o.b. Aetna, Pa.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$42.75	$42.75	$40.25	$38.00
Heavy melt. steel, No. 2, E. Pa.	41.50	41.50	39.00	36.75
Heavy melt. steel, No. 1 Chicago	41.75	41.75	39.25	38.75
Heavy melt. steel, No. 1 Valley	42.75	42.75	40.25	39.50
Heavy melt. steel, No. 1, Cleveland	42.25	42.25	39.75	38.25
Heavy melt. steel, No. 1 Buffalo	47.50	46.56	43.00	39.00
Rails for rerolling, Chicago	64.25	64.13	53.75	46.25
No. 1 cast, Chicago	70.00	70.75	68.38	43.50

Coke

Connellsville, beehive furnace	$14.50	$14.38	$13.00	$12.00
Connellsville, beehive foundry	17.00	17.00	15.22	14.50
Chicago, oven foundry, ovens	20.40	20.40	19.50	17.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa.; $66, Monessen, Pa.; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill, except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c, Monessen, Pa. One producer quotes 3.90c, Chicago base. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Aliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Atlanta, Seattle; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill.; 4.80c, Williamsport, Avis, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.10c, Youngstown; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.45c, Camden, N. J.; 5.30c, Los Angeles. One producer quotes 4.55c, Cleveland or Pittsburgh base, 4.75c, Worcester, Mass., base.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles. Fabricated: To consumers: 4.10c, Pittsburgh; 4.25c, S. Daquesne, Pa., Gary, Ind., Youngstown; 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; 5.25c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa., mill; 9.50c, Economy, Pa., mill. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa., mill; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O., 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Granite City, Ill., Ecorse, Mich., 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvannealed Sheets: 4.95c, mill, except: 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc) 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.75c, Pittsburg, Torrance, Calif.

Copper-Iron: 5.75c, Granite City, Ill.; 5.35c, Irvin, Pa., Gary, Ind.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: 7.75c, mill.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Long Ternes Ingot Iron: 5.20c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 6.05c, Niles, O. Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill.; 6.55c Niles, O. Cold-rolled, 6.20c, mill. Motor: 6.70c, mill except: 6.90c, Granite City. Dynamo; 7.50c, mill, except: 7.40c, Follansbee, W. Va., Toronto, O.; 7.70c, Granite City, Ill. Transformer 72, 8.05c, mill, except: 7.90c, Follansbee, W. Va., Toronto, O. 65, 8.60c, mill. 58, 9.30c, mill. 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich., Atlanta; 3.60c, Detroit; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 5.90c, Fontana, Calif.

* Wider than 6-in. and 6-in. and narrower, respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O.; 5.75c, Los Angeles; 7.10c, Fontana, Calif.

Cold-Rolled Alloy Strip: 9.50c, mill, except 9.80c, Worcester, Mass.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.30c, Worcester, Mass., 4.75c, Wallingford, Conn.; over 0.40 to 0.60 C, 5.50c, mill, except: 5.80c, Worcester, Mass., Wallingford, Conn.; over 0.60 to 0.80 C, 6.10c, mill, except: 6.40c, Worcester, Mass., Bristol, Wallingford, Conn.; over 0.80 to 1.05 C, 8.05c, mill, except: 8.35c, Worcester, Mass., Bristol, Conn.; over 1.05 to 1.35 C, 10.35c, mill, except: 10.30c, Wallingford, Conn.; 10.65c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00. Pittsburg, Calif., mill $7.35 and $7.55, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb. 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

Can Making Black Plate: Per base box of 100 lb. 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight, $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30. $5.75-$5.95, $5.65-$5.85, $5.75-$5.95, respectively, Pittsburg, Calif.

Holloware Enameling Black Plate: 29-gage, 4.75-4.95c per lb.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90-$6.00.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md.; 3.60c, Pittsburgh, Aliquippa, Pa.; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle; 5.80c, Fontana, Calif.; 5.85c, Harrisburg, Pa.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point. Md., Johnstown, Pa.; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa., 3.85c, Torrance, Calif.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.00c, Atlanta; 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa.; 4.70c, Portsmouth, O.; 5.10c, Pittsburg, Calif.; 5.40c, Shelton, Conn. One producer quotes 4.50c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Mass., Trenton, N. J., 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., 4.95c, Monessen, Pa.; 5.10c, Worcester, Mass.; 5.20c, Atlanta; 5.75c, Pittsburg, Calif. One producer quotes 5.15c, Chicago and Pittsburgh base; another, 5.20c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind.; 5.65c, Atlanta; 6.20c, Pittsburg, Calif. One producer quotes 5.60c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109 Worcester, Mass.; 110 Atlanta; 117, Portsmouth, O.; 123, Pittsburg, Calif.; 124, Cleveland; 126, Monessen, Pa.; $5.20 per 100 pound keg, Aliquippa, Pa.; $6.75, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 109, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Colmun 109, mill, except: 113 Monessen, Pa., Kokomo, Ind.; 121 Atlanta; 132, Pittsburg, Calif. One producer quotes column 113, Pittsburgh and Chicago base; another, column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126 Atlanta; 128 Monessen, Pa.; 143, Pittsburg, Calif. One producer quotes 127, Chicago and Pittsburgh base.

Fence Posts (with clamps): Column 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md.; 110, Atlanta; 130, Pittsburg, Calif. One producer quotes column 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	41½	12½	1¼ ...	46½–	24–
¼	39½	14		49	32
⅜	36	9	1½ ...	47–	24½–
½	40½–	16½ -		49½	32½
	43	24½	2	47½–	25–
¾	43½–	25½–		50	33
	46	28½	2½, 3..	48–	25½–
1	46–	23½–		50½	33½
	48½	31½	3½ & 4	44½	25

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	20	38½	19	27–	7½–
					38½	19
2½ ..	42½–	23–	41½	22	32½–	13–
	43½	24			41½	22
3	42½–	23–	41½	22	35–	15½–
	43½	24			41½	22
3½ & 4	42½–	25–	43½	24	38½–	19–
	46½	27			43½	24
5 & 6.	42½–	23–	43½	24	38½–	19–
	44½	25			43½	24
7	....	..	....	..	43½	23

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	40½	....	1¼ ...	47–	28–
¼	38½	....		48	29
⅜	35	....	1½ ...	47½–	28½ -
½	41–	20½–		48½	29½
	42	21½	2	48–	29–
¾	44–	24½–		49	30
	45	25½	2½ & 3	48½–	29½–
1	46½–	27½–		49½	30½
	47½	28½	3½ & 4	43½	

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	38½	19	37½	18	26–	6½–
					37½	18
2½ ..	41½–	23	40½	..	31½–	12–
	42½				40½	21
3	41½–	23	40½	..	34–	14½–
	42½				40½	21
3½-4..	41½–	22–	42½	..	37½–	18–
	45½	26			42½	23
5 & 6.	41½–	22	42½	..	40½–	20–
	43½	..			44½	24
8	45½	..	44½	24	41½–	21–
10 ...	45	..	44	23	44	23½
12 ...	44	..	44½	..	40½–	20
					43	22½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜...	+59½	+85	1¼..	+22	+42½
½...	+20½	+42	1½..	+15½	+35
¾...	+10½	+31	2....	+ 7½	+26
1 and			2½-3½	+ 5	+21.5
1¼	+ 4½	+22	4....	List	+15½
1½..	— 1½	+18½	4½-8	+ 2	+17
2....	— 2	+18	9-12.	+12	+26½

Boiler Tubes: Net base c.l. prices, dollars per 100′, mill; minimum wall thickness, cut lengths 4 to 24″; inclusive.

		——Seamless——		——Elec. Weld——	
O.D. In.	B.W. Ga.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1	13	....	13.39	13.00	13.00
1¼	13	....	15.87	13.21	15.39
1½	13	$15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Rails, Supplies

Rails: Standard, over 60-lb: $3.20 per 100 lb, mill.

Light (billet): $3.55 per 100 lb, mill.

Light (rail steel): $4.70 per 100 lb., Williamsport, Pa.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb., mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: 5.25c, Pittsburgh.

Axles: 5.20c, mill.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6-in. and shorter	37 off
⅝-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

	A.S. Light	A.S. Reg. and Heavy
Semifinished hexagon		
⅞-in. and smaller	41 off	....
½-in. and smaller	....	38 off
½-in.-1-in.	39 off	....
⅞-in.-1-in.	....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants,

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

Fob shipping point, to jobbers.....50c-$2 off

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.5c
18	4	3	...	...	114.5c
18	4	2	...	9	168.5c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$44.00	$44.50	$45.00	$45.50
Newark, N. J., del.	46.39	46.89	47.39	47.89
Brooklyn, N. Y., del.	....	48.40	48.90	....
Philadelphia, del.	46.17	46.67	47.17	47.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	44.00	44.00	44.50	45.00
Boston, del.	52.42	52.42	52.92	....
Rochester, del.	46.22	46.22	46.72	47.22
Syracuse, del.	47.025	47.025	47.525	48.025
Chicago, furnace	42.50-43.00	43.00-43.50	43.50	44.00
Milwaukee, del.	44.22-44.72	44.72-45.22	45.22	45.72
Muskegon, Mich., del.	....	49.65-50.15	50.15	....
Cleveland, furnace	43.00	43.50	43.50	44.00
Akron, del.	45.17	45.67	45.67	46.17
Duluth, furnace	43.00	43.50	44.00	44.50
Erie, Pa., furnace	42.50	43.00	43.50	44.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	43.00	43.50	....	....
Seattle, Tacoma, Wash., del.	....	50.63	....	....
Portland, Oreg., del.	....	50.63	....	....
Los Angeles, San Francisco	50.13	50.63	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65	49.15	49.65	....
Ironton, Utah, furnace	....	43.50	....	....
‡Neville Island, Pa., furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	43.00	43.50	43.50	44.00
Sharpsville, Pa., furnace	43.00	43.50	43.50	44.00
Steelton, Pa., furnace	44.00	44.50	45.00	45.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	42.50	43.00	43.50	44.00
Cincinnati, del.	47.05	47.55	....	....
Youngstown, O., furnace	43.00	43.50	43.50	44.00
Mansfield, O.	46.87	47.37	47.37	47.87

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base).$56.50
6.51-7.00.. 57.75 9.01- 9.50. 64.00
7.01-7.50.. 59.00 9.51-10.00. 65.25
7.51-8.00.. 60.25 10.01-10.50. 66.50
8.01-8.50.. 61.50 10.51-11.00. 67.75
8.51-9.00.. 62.75 11.01-11.50. 69.00

Fob Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $81.75 furnace, Niagara Falls; $81 open-hearth and $82 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn. .....$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $50. Philadelphia $52.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $48.00.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-15.50
Connellsville, foundry	16.00-18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
Chicago, ovens	20.40
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
New England, del.	22.75
Birmingham, del.	17.86
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Ironton, O., ovens	18.25
Erie, Pa., del.	22.45
Painesville, O., ovens	20.90
Cleveland, del.	22.45
Buffalo, del.	23.10
Detroit, del.	21.65
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens	19.25

Coal Chemicals

Spot, cents per gallon, ovens
(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50

Per pound, ovens

Phenol, 40 (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00
Naphthalene flakes, balls, bbl to jobbers, "household use"	12.00

Per ton, bulk, ovens

Sulphate of ammonia	$45.00

Refractories

(Prices per 1000 brick, fob plant)

Fire Clay Brick

Super Duty: St. Louis Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.; Goose Lake, Ill.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)

Domestic dead-burned, ⅝" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69%	18.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	A-R Alloy **4140	Standard Structural Shapes	Carbon ⅝"-¾"	Floor ⅝" & Thicker
Boston (city)	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24-9.74	5.54	5.89	7.34
Boston (c'try) ...	5.69	6.49	7.69	5.89	6.75	5.54	6.24	8.09-9.59	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.83	6.58	8.22	5.52-5.78	5.98	7.48
New York (c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.63	6.38	...	5.32-5.58	5.78	7.28
Phila. (city) ...	5.50-5.86	6.61-6.81	7.42-7.62	5.46-5.81	...	5.57-5.65	6.31	7.94	5.24-5.40	5.52-5.65	6.73-7.16
Phila. (c'try) ...	5.35-5.71	6.46-6.66	7.27-7.47	5.31-5.66	...	5.42-5.50	6.16	7.79	5.09-5.25	5.37-5.50	6.58-7.01
Balt. (city)	5.43†	6.33	7.13	5.49	...	[illegible]			[illegible]	[illegible]	[illegible]
Balt. (c'try)	5.28†	6.18	6.98	5.34	...	5.39	...	...	5.33	5.53	6.98
Norfolk, Va.	5.75	...	...	...	...	6.00	7.00	...	6.00	6.00	7.50
Buffalo (del.) ..	5.20-5.25	5.95-6.00	7.75	5.70	6.50	5.35	6.05	9.50	5.25	5.60	7.70
Buffalo (w'house)	5.05-5.10	5.80-5.85	7.60	5.55	6.35	5.20	5.90	9.40	5.10	5.45	7.55
Pitts (w'house) ..	4.85-5.00§	5.75-5.85[8]	7.00-7.05	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Detroit (w'house)	5.40§	6.30	7.60	5.40	...	5.45	6.17	8.12	5.45	5.65	7.10
Cleveland (del.)	5.13-5.29	6.00-6.29	7.34-7.49	5.17-5.69	6.35	5.30-5.34	6.05-6.10	7.94-8.29	5.34-5.60	5.50-5.54	6.95-6.99
Cleveland (w'hse)	4.98-5.75	5.75-6.14	7.19-7.85	5.02-5.54	6.10	5.15-5.19	5.90-5.95	7.79-8.14	5.19-5.45	5.35-5.39	6.80-6.84
Cincinnati (w'hse)	5.26	6.11	7.60	5.52	6.07	5.52	6.07	...	5.37	5.61	6.91
Chicago (city) ..	5.20	5.90‡[8]	7.20	5.00	6.30	5.05	5.85	7.80[9]	5.05	5.25	6.70
Chicago (w'house)	5.05	5.75‡[8]	7.05	4.85	6.15	4.90	5.70	7.65[9]	4.90	5.10	6.55
Milwaukee (city).	5.37	6.07‡[8]	7.37	5.17	6.47	5.22	6.02	7.97[9]	5.22	5.42	6.87
St. Louis (del.)..	5.34§	6.24[8]	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. Louis (w'hse)	5.19§	6.09[8]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city).	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41
Birm'ham (c'try)	5.05§	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26
Omaha, Nebr. ..	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Angeles (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
Los Angeles (w'house) ...	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
San Francisco ...	5.95[21]	7.15	8.05	6.75[21]	8.25[18]	5.90[21]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma .	6.35[17]	7.90[8]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[3]	6.30[17]	6.35[17]	8.40[21]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $57, Palmerton, Pa., $56, Pittsburgh and Chicago; (16% to 19% Mn.) $1 per ton lower. Prices $5 per ton higher at Palmerton, effective as of Sept. 10 on spot; Oct. 1 on contracts.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, Alloy, W. Va., Welland Ont., Sheridan, Pa., and Lynchburg, Va.; $147 Johnstown, Pa., mill. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $148 fob Aetna, Pa. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.80c; Central, add 0.3c for c.l. and 1.1c for l.c.l. Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%. C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20c, less ton 21.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 35c per lb of metal, carload packed 35.5c, ton lot 37c, less ton 39c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%), Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l. lump, bulk 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

> Quotations on ferroalloys include advances scheduled to become effective Oct. 1 and which are detailed in the article appearing on page 177 of Sept. 13 issue. For prices on these products prevailing currently and until effective date of the increases, refer to page 155 of the Sept. 6 issue of STEEL.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 30.75c per lb of contained Cr, 0.04% C 29.75c, 0.05% C 29.25c, 0.06% C 28.75c, 0.10% C 28.25c, 0.15% C 28c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 2% C 27c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Chromium Metal: (Mn 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.045 less ton $1.07; Central, add 1.5c, for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 10.5c per lb of contained Si, carload packed 12.1c; ton lot 13.55c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c, for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13c per lb of contained Si carload packed 14.3c, ton lot 15.45c, less ton 16.7c; Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 14.65c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone c.l., lump, bulk, regular 19c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 13.75c per lb or briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c; Central, add 0.25c for

(*Please turn to Page* 182)

Supplies of Copper Increase

Stocks of refined metal increase 1477 tons during July despite cut in output. Consumers' requirements remain unsatisfied. Strikes hamper lead, zinc operations

New York—While supplies of copper are increasing, those of lead and zinc are still restricted by labor disturbances in the western producing areas.

Copper — Domestic stocks of refined copper increased to 81,946 tons at the end of August, an increase of 1477 tons over the July 31 total of 80,469 tons. This compared with 77,212 tons at the end of August, 1947. Refined copper output eased to 102,798 tons from 107,014 tons in July and compared with 88,122 tons in August of last year. This brought output for the first seven months of this year to 830,389 tons compared with 789,629 tons for the like period in 1947.

Deliveries declined to 106,467 tons in August from 108,085 tons in July and compared with 95,227 tons in August, 1947. Deliveries to customers totaled 905,009 tons in the first seven months of this year against 956,047 tons in the like period a year ago.

Heavy demand for October delivery of copper continues, especially from the wire mills. Present indications are that not all of the demand can be satisfied. Prices remain firm at 23.50c, Connecticut Valley, for electrolytic.

Lead — According to unconfirmed trade reports, the British Ministry has made an agreement to buy Australian lead for fourth quarter delivery at £102 15s per pound, f.a.s. Australian ports, or an increase of £11 over the price paid during the third quarter. The new price is equivalent to 18.48c per pound compared with 16.51c during the third quarter. The Ministry's buying price for Canadian lead has been increased 2 cents per pound for the fourth quarter to 18.10c, f.o.b. Trail, B. C. It is believed that an advance in the maximum selling price in England is inevitable.

Imports of refined lead into the United States increased sharply to 23,969 tons in July from 11,145 tons in June, according to the American Bureau of Metal Statistics. Total imports in the first seven months amounted to 114,339 tons, or an increase of about 22,975 tons over the total for the like 1947 period. Of the 1948 imports, 46,231 tons came from Mexico, 29,299 tons from Canada, 12,802 tons from Peru, and 10,694 tons from Australia.

Total stocks of lead held by smelters and refiners declined during July to 117,285 tons from 123,205 tons at the end of the preceding month. The Aug. 1 total was the smallest recorded since Jan. 1, 1943. The decline was caused principally by a drop of about 3200 tons in stocks in ore and matte and in process at smelteries to 67,894 tons as a result of the St. Joseph Lead Co. strike.

Zinc — Unfilled orders for zinc on the books of smelters declined about 4600 tons further in August to 60,357 tons, the lowest of the year to date. Smelter production totaled 68,180 tons in August, or a decline of about 1700 tons due to strikes at western plants. The daily rate of production declined to 2199 tons, the smallest average since August, 1947. Shipments to domestic consumers totaled 63,712 tons in August, an increase of about 2400 tons, while shipments on export and drawback account amounted to 4893 tons, an increase of about 700 tons. Total shipments came to 68,605 tons against 67,377 tons in July. Stocks of slab zinc at the smelteries remained steady at 45,246 tons.

Tin — Production of tin concentrates in the Netherlands East Indies during August was the equivalent of 2543 gross tons, compared with 2547 tons in July and 1120 tons in August, 1947. Billiton and Singkep production was at a new postwar high of 1126 tons and 275 tons, respectively, while Banka output totaled 1142 tons. Production during the first eight months totaled 19,052 tons compared with 9194 tons for the like 1947 period. Shipments of Straits tin in August amounted to 4419 tons of which 1615 tons were from Singapore and 2804 tons from Penang.

Stocks of pig tin held by the Office of Metals Reserve which were available for sale on Aug. 31 amounted to 39,911 tons, or an increase of 2793 tons for the month and about 28,000 tons since the middle of 1947 when the Reconstruction Finance Corp.'s stocks were down to about 12,000 tons.

The Longhorn smelter in Texas produced 3502 tons of tin in August compared with 3509 tons in July and 2237 tons in August, 1947. Production during the first eight months came to 25,440 tons compared with 22,110 tons in the like 1947 period.

Titanium Metal on Market

Wilmington, Del.—E. I. du Pont de Nemours & Co. has begun small scale manufacture of titanium metal, a new basic raw material for industrial development.

A pilot unit of 100 pounds daily capacity has been successfully placed in operation at the Newport, Del., plant of the pigments department. It is believed this is the first time ductile titanium metal has been produced for commercial exploration. The Bureau of Mines has been producing the metal for research purposes.

The silver-white metal is light and strong. It is highly resistant to corrosion and has a higher melting point than the commonly used metals. It is comparable to stainless steel in strength and corrosion resistance, but weighs only a little more than half as much per unit of volume. It is less than twice as heavy as aluminum, but several times as strong, in bars of comparable dimensions, the company claims.

Du Pont is producing and offering it for exploration as a basic raw material for industry and engineering. It has many interesting properties, but exhaustive research will be needed to develop the full possibilities of titanium metal. When this work is done and if titanium alloys work out as expected, scientists believe they may have a new family of structural materials superior in many ways to any metal or alloys now known.

Titanium metal is so new as an industrial material that little is now known about what it will do. Enough is known, however, to indicate that it can be used where a high ratio of strength to weight is needed. Reports of the Bureau of Mines and other organizations indicate that an early major use may be in high speed planes and other forms of transportation. It may go into corrosion resistant equipment and industrial machinery such as printing presses and textile equipment.

These reports also indicate that the properties of titanium are such that it may be used for reciprocating mechanical parts and in jet engines where heat and pressure are great.

Further research on the metal is now being carried on by other organizations, not only to determine its uses but also to determine its alloying possibilities. Meanwhile, du Pont technologists are in the midst of preliminary design work to expand production and improve the present manufacturing process.

Titanium is plentiful in nature, but is very difficult to separate in pure form from its ores. This fact has kept it practically a laboratory curiosity since its discovery. There are enough workable deposits of rutile and ilmenite, the ores from which it comes, in the United States and Canada that America may become independent of overseas sources.

Du Pont has long used large quantities of the ore to obtain titanium in oxide form for paint pigments. Research leading to its production in metallic form grew out of this experience. The manufacturing process is basically a chemical one.

Du Pont became active in basic research on the metal before World War II, but stopped during the war. The Bureau of Mines continued its efforts and had developed a successful method of refining it by the end of the war. After the war, du Pont resumed its research which resulted in the successful production announced last week.

Most titanium metal which has been available heretofore has been in powder form. Du Pont is producing it now in sponge form and will shortly be producing ingots weighing up to 100 pounds. Running 99.5 per cent plus of purity, the metal is ductile and can be rolled and drawn readily. It has high resistance to breaking or pulling and has high strength against distortion.

Present price of the du Pont product is $5 per pound for quantities of 100 pounds or more in sponge form. Ingot prices will be set later. The company will supply small samples without charge to industrial and university laboratories for testing. As the process is improved and if demand warrants mass production of the new metal, the company hopes to be able to reduce the price sharply.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½ Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

Zinc: Prime western 15.00c, brass special 15.25c, intermediate 15.50c, East St. Louis; high grade 16.00c, delivered.

Lead: Common 19.30-19.35c chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 16.00-17.00c, pigs, 15.00-16.00c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 24.00-24.75c; No. 12 foundry alloy (No. 2 grade) 23.50-24.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.25-25.75c; grade 2, 24.50-25.00c; grade 3, 24.00-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.90, del.; special or patented shapes, $2.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 75.25c per ounce.

Platinum: $93-$96 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, fob mill)

Sheet: Copper 37.18; yellow brass 33.75; commercial bronze, 95%, 37.11; 90%, 36.63; red brass, 85%, 35.64; 80%, 35.16; best quality, 34.63; nickel silver, 18%, 46.41; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.03; cold drawn 34.28; yellow brass, free cutting, 33.44; commercial bronze, 95% 36.80; 90% 36.32; red brass, 85% 35.33; 80% 34.85.

Seamless Tubing: Copper 37.22; yellow brass 36.76; commercial bronze 90% 39.29; red brass 85% 38.55; 80% 38.07.

Wire: Yellow brass 34.04; commercial bronze, 95% 37.40; 90% 36.92; red brass, 85% 35.93, 80% 35.45; best quality brass 34.92.

Copper Wire: Bare, soft, fob eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, fob eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2c and 3c mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	25.9	...	...
0.135-0.096	12-48	26.4	...	...
0.095-0.077	12-48	26.9	25.0	28.6
0.076-0.068	12-48	27.5	25.2	28.8
0.067-0.061	12-48	27.5	25.2	28.8
0.060-0.048	12-48	27.7	25.4	29.1
0.047-0.043	12-48	28.1	25.6	29.4
0.042-0.038	12-48	28.1	25.6	29.4
0.037-0.030	12-48	28.5	26.0	29.9
0.029-0.024	12-48	28.9	26.3	30.3
0.023-0.019	12-36	29.5	26.7	30.8
0.018-0.017	12-36	30.1	27.3	31.6
0.016-0.015	12-36	30.8	27.9	32.5
0.014	12-24	31.7	28.7	33.6
0.013-0.012	12-24	32.6	29.4	34.5
0.011	12-24	33.6	30.3	35.7
0.010-0.0095	12-24	34.6	31.3	37.0
0.009-0.0085	12-20	35.8	32.4	38.5
0.008-0.0075	12.20	37.1	33.6	40.1
0.007	12-18	38.5	34.9	41.9
0.006	12-18	40.0	36.2	46.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	—Round— 17S-T	—Hexagonal— R317-T	—Hexagonal— 17S-T
0.125	45.0	47.0	...	...
0.156-0.203	38.5	40.0	...	...
0.219-0.313	35.5	37.0	...	...
0.344	34.0	36.00	...	...
0.375	33.0	35.5	42.5	43.0
0.406	33.0	35.5	...	...
0.438	33.0	35.5	42.5	43.0
0.469	33.0	35.5	...	...
0.500	33.0	35.5	42.5	43.0
0.531	33.0	35.5	...	...
0.563	33.0	35.5	40.5	40.5
0.594	33.0	34.5	...	...
0.625	33.0	35.5	40.5	40.5
0.656	33.0	35.5	...	...
0.688	33.0	35.5	40.5	40.5
0.750-1.000	32.0	34.5	37.0	38.0
1.063	32.0	34.5	35.5	36.5
1.125-1.500	31.0	33.5	35.5	36.5
1.563	31.0	33.5	...	35.5
1.625	30.0	32.5	34.5	35.5
1.688-2.000	30.0	32.5	...	...
2.125-2.500	29.5	31.5	...	...
2.625-3.375	28.5	30.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $23.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $22.50 per cwt; cut coils, $22.75. Traps and Bends: List price plus 70%.

ZINC

Sheets, 19.50-20.00c, fob mill, 36.00 lb and over. Ribbon zinc in coils, 18.25c-19.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 17.25c; over 12-in., 18.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Aug. Avg.	23.230	19.325	15.000	103.00	16.269	35.000	40.000	73.790
Sept. 1	23.50	19.30–19.350	15.000	103.00	16.00–17.000	35.000	40.000	74.750
Sept. 2	23.50	19.30–19.350	15.000	103.00	16.00–17.000	35.000	40.000	75.000
Sept 3-16	23.50	19.30–19.350	15.000	103.00	16.00–17.000	35.000	40.000	75.250

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb, or 500-lb bbl, 24.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 39.25c, fob Cleveland; 39.00c, Detroit; 38.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 23.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.000	17.750	17.125
Commercial Bronze			
95%	20.125	19.875	19.375
90%	19.750	19.500	19.000
Red brass			
85%	19.750	19.500	19.000
80%	19.500	19.250	18.750
Best Quality (71-79%)	19.000	18.750	18.250
Muntz Metal	17.250	17.000	16.500
Nickel, silver, 10%...	19.625	19.375	9.813
Phos. bronze, A.	22.625	22.375	21.375
Naval brass	17.750	17.500	17.000
Manganese bronze ...	17.750	17.500	16.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.25, No. 2 copper 18.25, light copper 17.25, composition red brass 16.00, auto radiators 13.25, heavy yellow brass 11.50, brass pipe, 12.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.25-20.50, No. 2 copper 19.00-19.25, light copper 18.00-18.25, refinery brass (60% copper), per dry copper content 18.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.75-18.00, No. 2 16.75-17.00, light copper 15.75-16.00, No. 1 composition red brass 13.75-14.00, No. 1 composition turnings 13.25-13.50, mixed brass turnings 8.00-8.25, new brass clippings 15.00-15.50, No. 1 brass rod turnings 12.00-12.50, light brass 7.50-8.00, heavy yellow brass 9.75-10.00, new brass rod ends 12.50-13.00, auto radiators, unsweated 11.50-12.00, cocks and faucets 11.25-11.75, brass pipe 11.00-11.50.

Lead: Heavy 17.00-17.50, battery plates 11.50, linotype and stereotype 18.00-18.50, electrotype 16.50-17.00, mixed babbitt 15.75-16.25, solder joints, 19.75-20.25.

Zinc: Old zinc 7.75-8.25, new die cast scrap 6.25-6.75, old die cast scrap 4.00-4.50.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 12.00-12.50, old sheets 10.00-10.50, crankcase 10.00-10.50, borings and turnings 5.50-6.00, pistons, free of struts, 10.00-10.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 & 3 Bundles	42.50-43.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	37.50-38.00
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	39.50-40.00
Bar Crops and Plate	49.00-49.50
Low Phos. Steel	49.00-49.50
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	65.00-66.00
Machinery Cast	72.00-73.00
Charging Box Cast	59.00-60.00
Heavy Breakable Cast.	57.00-58.00
Malleable	69.00-70.00
Brake Shoe	55.50-56.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00
R.R. Malleable	75.00-80.00
Axles	55.00-56.00
Rails, Rerolling	58.00-59.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	61.00-62.00
Rails, 18 in. and under	62.00-63.00
Railroad Specialties	61.50-62.00
Uncut Tires	54.50-55.00
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings.	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	69.00-71.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	78.00-80.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	78.00-80.00
Rails, Rerolling	60.00-66.00
Rails, Random Lengths	58.00-59.00
Rails, 3 ft and under	63.00-64.00
Cast Steel	56.00-58.00
Railroad Specialties	58.00-59.00
Uncut Tires	55.00-56.00
Angles, Splice Bars	61.00-62.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings.	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings.	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings.	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	57.00
Charging Box Cast	45.00
Heavy Breakable Cast.	56.00
Stove Plate	50.00
Unstripped Motor Blocks	50.00
Brake Shoes	48.00
Clean Auto Cast	57.00
Drop Broken Cast	65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	70.00
Rails, Rerolling	55.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	61.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turning	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast.	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$48.00-48.50
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	36.75-37.25
Mixed Borings, Turnings	36.75-37.25
Cast Iron Borings	37.75-38.25
Short Shovel Turnings.	38.75-39.25
Low Phos.	49.00-50.00

Cast Iron Grades

No. 1 Cupola	65.00-67.00
Mixed Cupola	63.50-64.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	60.00-61.00
Railroad Specialties	55.00-56.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-46.00
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	37.50
Mixed Borings, Turnings	37.50
Short Shovel Turnings.	38.50
Bar Crop and Plate	50.00-51.00
Punchings & Plate Scrap	50.00-51.00
Cut Structurals	50.00-51.00
Elec. Furnace Bundles.	47.00-48.00
Heavy Turnings	45.50-46.50
No. 1 Chemical Borings	44.00-45.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	67.00-68.00
Charging Box Cast	62.00-62.50
Heavy Breakable Cast.	62.00-62.50
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings.	30.00-31.50
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles.	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	56.00-57.00
Heavy Breakable	56.00-57.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$38.90
No. 2 Heavy Melt. Steel	34.40
No. 1 Bundles	34.40
No. 1 Busheling	34.40
Machine Shop Turnings	29.40
Mixed Borings, Turnings	29.40
Short Shovel Turnings	31.40
Bar Crops and Plate	39.00-40.00
Punchings & Plate Scrap	39.00-40.00
Chemical Borings	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	65.00-70.00
Heavy Breakable Cast.	60.00-62.00
Stove Plate	54.00-55.00
Unstripped Motor Blocks	48.00-50.00
Clean Auto Cast	54.00-56.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	39.00-39.50
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles.	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	71.00-72.00
Clean Auto Cast	71.00-72.00
No. 1 Wheels	64.00-65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	47.00-48.00
Malleable	80.00-81.00
Rails, Rerolling	64.00-65.00
Rails, Random Lengths	58.00-59.00
Rails, 3 ft and under	62.00-63.00
Rails, 18 in. and under	63.00-64.00
Railroad Specialties	55.50-56.50
Angles, Splice Bars	59.00-60.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$44.00-45.00
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	35.00-36.00
Short Shovel Turnings	36.50-37.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-66.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast.	59.00-60.00
Brake Shoes	60.00-61.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R. R. Malleable	71.00-72.00
Rails, Rerolling	63.00-65.00
Rails, Random Lengths	56.00-59.00
Rails, 3 ft. and under	60.00-61.00
Uncut Tires	51.00-52.00
Angles, Splice Bars	54.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.00

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*27.50
No. 2 Heavy Melt Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling	27.50
Nos. 1 & 2 Bundles	27.50
No. 3 Bundles	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Heavy Breakable Cast.	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
Nos. 1 & 2 Bundles	27.50
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchinge & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

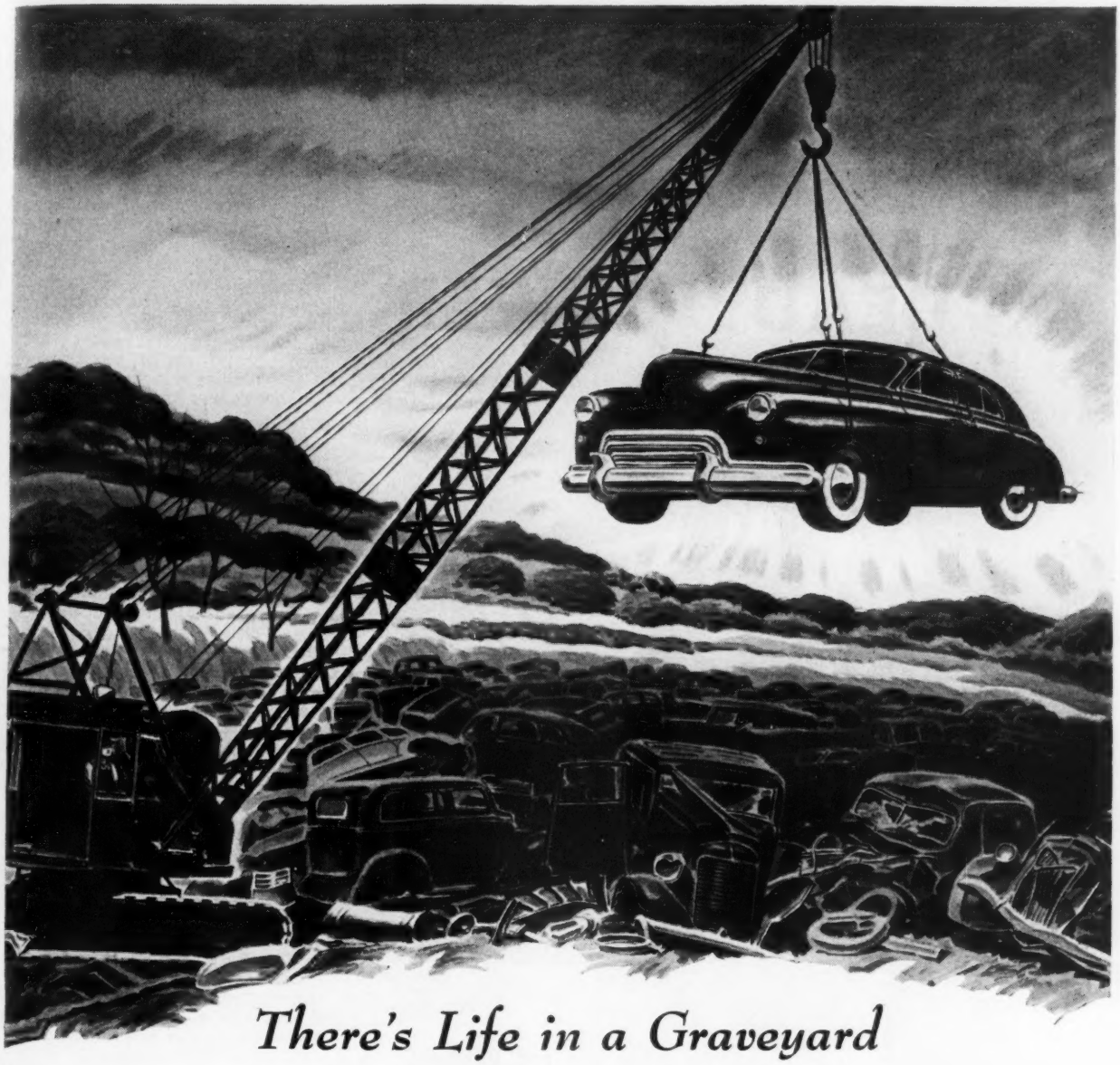
(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.



There's Life in a Graveyard

Auto "graveyards" represent a potential source of 4,500,000 tons of scrap annually. With facilities to process 3,000,000 cars, the wrecking industry is only receiving 500,000 cars a year. New equipment is urgently needed by fleet operators, bus and truck companies. They must turn in their overage and obsolete vehicles now. Scrap from every available source is needed to fill steel requirements.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

Main Office
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Pennsylvania

Yards
LEBANON, PA. • READING, PA.
DETROIT (ECORSE), MICH.
MODENA, PA. • PITTSBURGH, PA.

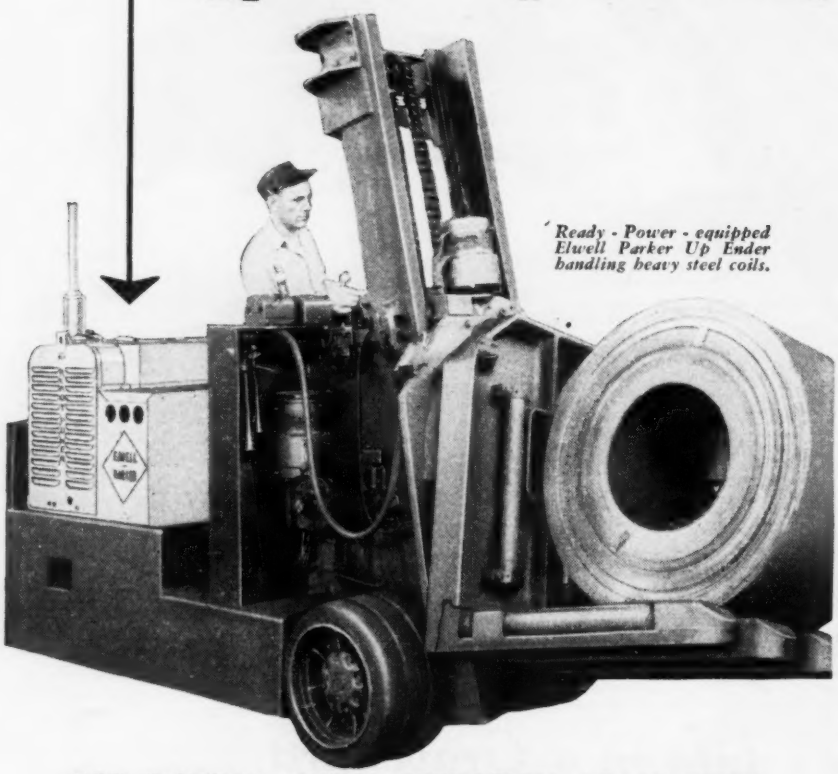
Branch Offices

BIRMINGHAM, ALA. Empire Bldg.	CHICAGO, ILL. 100 W. Monroe St.	HOUSTON, TEXAS Cotton Exchange	PITTSBURGH, PA. Oliver Bldg.
BOSTON, MASS. Statler Bldg.	CLEVELAND, O. 1022 Midland Bldg.	LEBANON, PA. Luria Bldg.	PUEBLO, COLO. Colorado Bldg.
BUFFALO, N. Y. Genesee Bldg.	DETROIT, MICH. 2011 Book Bldg.	NEW YORK, N. Y. Woolworth Bldg.	READING, PA. Luria Bldg.

ST. LOUIS, MO.
2110 Railway Exchange Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

more power WITH READY-POWER



Ready - Power - equipped Elwell Parker Up Ender handling heavy steel coils.

FOR ELECTRIC TRUCK OPERATION AT ITS BEST!

Ready-Power-equipped electric trucks provide more power for heavy loads, more continuous hours of service and more materials handled in any given period. Dependable electric power is generated right on the truck chassis by an engine-driven, direct-current generator. Get the most out of your electric trucks. Convert them to Ready-Power. Specify Ready-Power on your new trucks. Write for descriptive literature.

Ready - Power - equipped Automatic Ram Trucks handling steel coils.

THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

Sheets, Strip . . .

General consumer quotas for fourth quarter to be cut. Some on month-to-month basis

Sheet Prices, Page 158

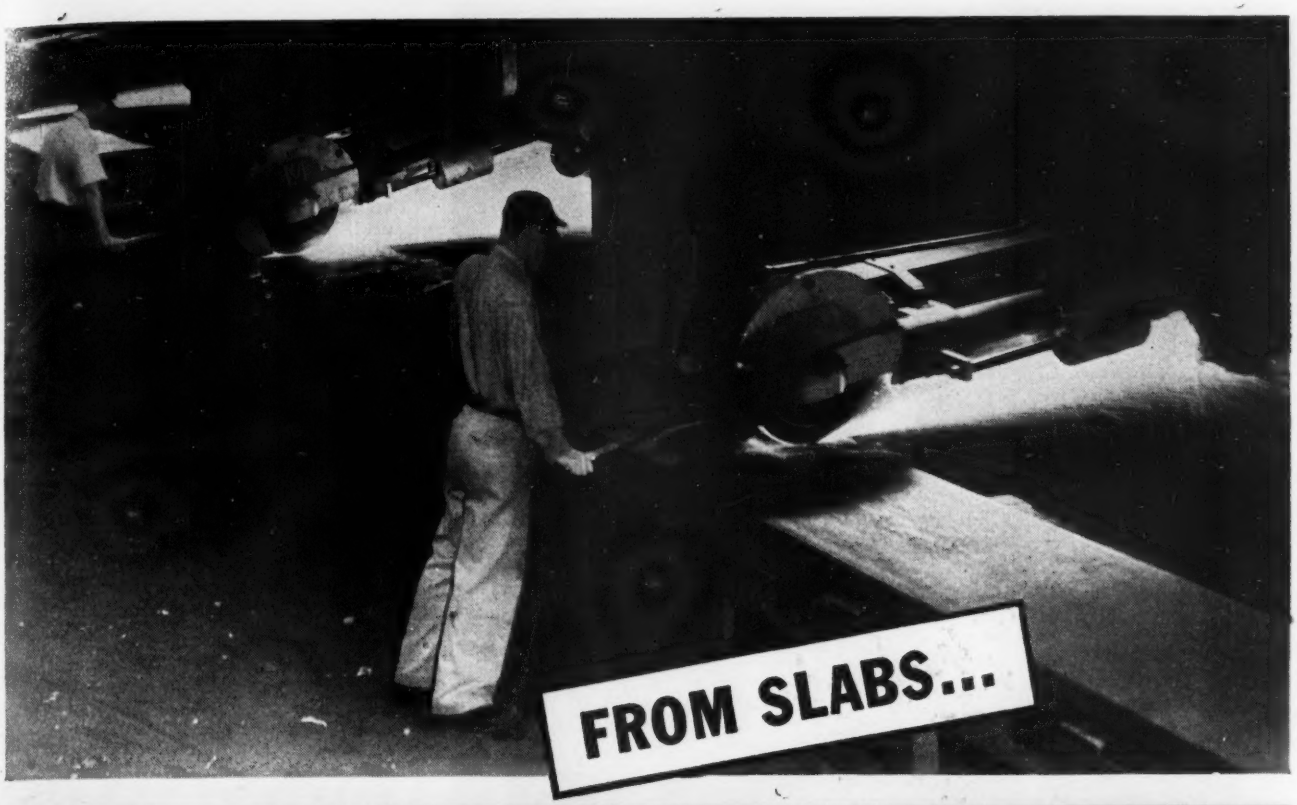
New York—A leading sheet producer has just rounded out quotas for fourth quarter on galvanized and cold-rolled sheets and is expected momentarily to take similar action with respect to hot-rolled sheets. Until recently this seller had not set up quotas for its general trade on any of the major sheet grades beyond October. Certain other sellers have done nothing beyond October, at least two declare that they will probably go on a month-to-month basis over the remainder of this year, insofar as hot and cold rolled sheets are concerned.

Sheet sellers believe that, unless there is a national emergency, they will not be further confronted over the remainder of this year with the necessity for allowing for much additional priority tonnage; however, some are moving cautiously because of the possibility of some such emergency and therefore are endeavoring to set up quotas on a month-to-month basis. Others take the position that it is more satisfactory from their standpoint and especially from that of the customer's to set up allotments for the entire quarter as soon as possible. They point out that in the event of a national emergency plans of all producers, regardless of present procedure in quoting, would come in for sharper vision.

General consumer quotas for the final three months will be smaller than for the current quarter. Fourth quarter operations are usually better than third quarter, but extra allowances that have to be made for heavier voluntary allocations will likely offset this possible advantage. Consumers generally, however, should fare better in the fourth quarter than a year ago because of the more pronounced increase in production that is contemplated, compared with the final quarter in 1947.

Boston—Cold strip producers are closing books for fourth quarter in some instances, with most consumers taking up full quotas. Demand holds at high level, although some consumer goods are slower at retail. Non-integrated mills are concerned over prospects for enough hot-rolled stock for finishing to meet commitments, notably in carbon grades. Although hot-rolled alloy supply has tightened, it is more critical in carbon. Carbon sheet users have had allocations cut up to 15 per cent for fourth quarter, with additional reductions likely in galvanized to meet down-spout and gutter requirements.

St. Louis—New adjustment difficulties in Granite City Steel Co.'s new cold reduction mill and consequent future production uncertainty obliged the company to postpone opening its fourth quarter books last week as planned. Acceptance of sheet orders may be deferred to this month's end. Sheet output remains slightly above 50 per cent of capacity. The company's rolling equipment caught up with ingot production last week for the first time since July, and there



Or from castings to ball races, billets to bits — whatever your grinding wheel problem is—a U.S. Royalite Wheel can handle it.

U. S. Rubber technicians can precisely engineer each wheel to your specifications. And whenever your operating conditions change, very often these specialists can *quickly* fill specifications never before demanded in a grinding wheel.

Research and experience are the backbone of U. S. Rubber success . . . research that covers not only bonds and abrasives, but also related fields served by the products of U. S. Rubber. This has been going on for over 85 years.

Moreover, your actual operating costs can be told in *advance*, by means of tests right in your own plant.

For complete information, write to Mechanical Goods Division, United States Rubber Company, Fort Wayne, Indiana.

U. S. ROYALITE GRINDING WHEELS

Engineered to Your Job

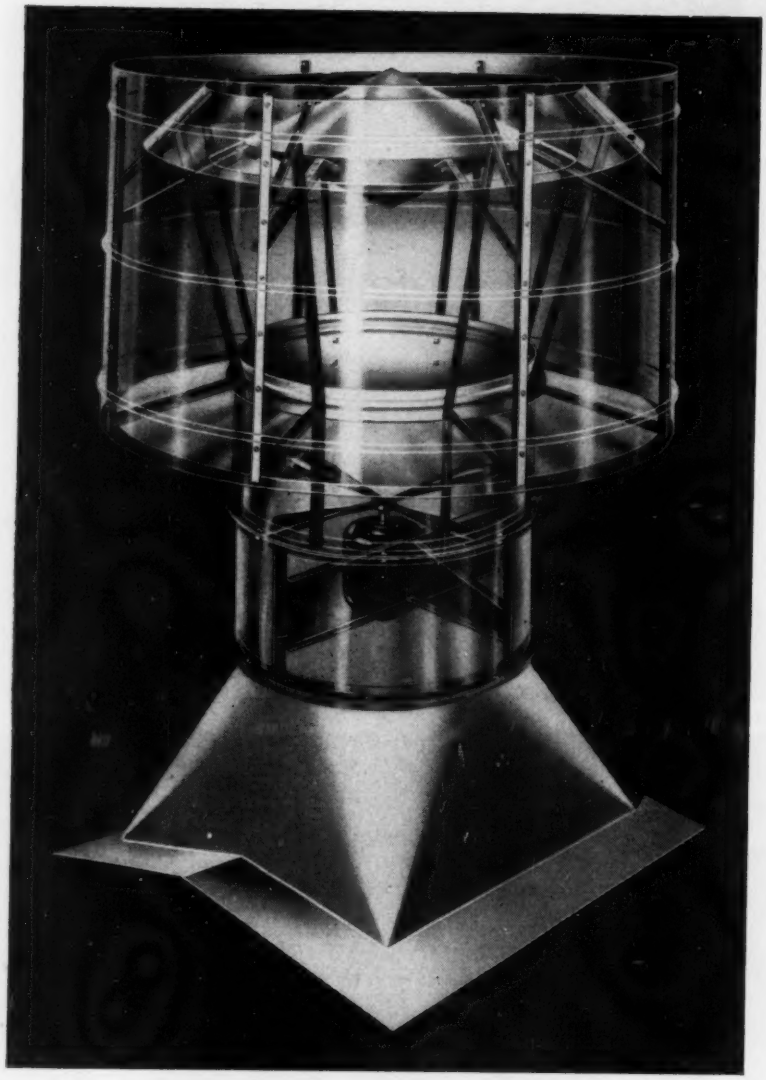
MADE ONLY BY

U.S.RUBBER

SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

BURT FREE-FLOW FAN VENTILATOR



FOR ACCELERATED VENTILATION WHENEVER YOU NEED IT AND ADEQUATE VENTILATION ALL THE TIME!

The Burt Free-Flow Fan Ventilator is a dual-purpose unit. With power off, it provides gravity ventilation usually adequate for normal needs. When occasional production operations create extremely high temperatures or an excess of smoke, dust, fumes, etc., its high velocity electric fan quickly exhausts the extra heat or impurities. Positive ventilation is assured *at all times*. Write for further information on the versatile Free-Flow Fan and other Burt ventilators. There is a type and size for every need.

SEE SWEET'S OR WRITE FOR CATALOG AND DATA SHEETS

The BURT MFG. *Co.*

905 S. High Street Akron 11, Ohio, U. S. A.

VENTILATORS • LOUVERS • OIL FILTERS • SHEET METAL SPECIALTIES

is prospect the ingot pile may get no higher.

Pittsburgh — Scheduled reductions in mill sheet allotments to those consumers not within scope of voluntary allocation programs vary considerably by type of product and also are not uniformly curtailed in each of the remaining months this year. In general, plain hot and cold-rolled sheet allotments have been cut 10 per cent. However, some interests have not reduced allotments to this extent on galvanized, silicon and enameling sheets or hot-rolled strip. Impact of the voluntary allocation programs on steel mill schedules varies considerably among producers. Some companies, for example, have agreed to take on new customers under these programs, and it is also pointed out that increase in steelmaking or finishing capacity is not uniformly applicable among producers. Nonintegrated cold-rolled strip producers continue to quote well above $4 per 100-pound level established by major integrated interests. This is attributed to higher hot-rolled strip prices quoted by some integrated producers, plus increased wage and other operating costs in form of "open market" purchases of semifinished steel. Similarly nonintegrated interests are quoting higher prices on high-carbon cold-finished spring steel. These premium prices range from $5 to $18 a ton over major integrated mills' quotations. Some nonintegrated companies continue to meet competition in addition to establishing prices at their mills.

Cleveland — Offerings which are being made here indicate that some resellers on the eastern seaboard have a rather good supply of steel for sale "at prices that are not too bad," on the basis of f.o.b. Boston, New York, or other Atlantic ports. It is believed that the tonnages being offered are being imported from foreign countries. One item being offered, for instance, was 1000 tons of 14 to 15 gage galvanized steel sheets at 7.75c per pound. Delivery was promised from four to six weeks on this item, or about four months quicker than some users are able to get from domestic production sources.

Chicago — Consumers of sheets and strip and other flat-rolled products are showing increasing concern over their prospects for getting adequate material to maintain manufacturing operations during fourth quarter. Some mills have reduced October quotas to make room for the various voluntary allocation programs and it is almost certain that these cuts will have to be continued or deepened in November and December. Other mills are retaining third quarter quotas for the next three months, but explaining that they probably will not be fully met when the allocation programs get rolling. Here and there it is reported that consumers are casting about to determine whether they can fit into the allocation program for preferred industries, in order to keep fabricating facilities occupied.

Cincinnati — District sheet mills have set up schedules for the fourth quarter which show cuts in tonnage due to heavy carryover and to the voluntary allocation programs. Although all specifications are thus affected, the largest bite was taken

from cold-rolled quotas, in contrast with the commitments earlier in the year. Pressure for tonnage was seldom greater, reflecting the tight supply situation.

Birmingham—Some confusion is reported in the sheet situation due to differences in pricing, according to local sources. No immediate explanation of the situation is to be had, but variances of methods of basing is reported. However, with demand greatly in excess of supply, price seems of secondary importance. Most sheet users are willing to pay all the tariff will bear, availability of sheets being of prime importance.

Plates . . .

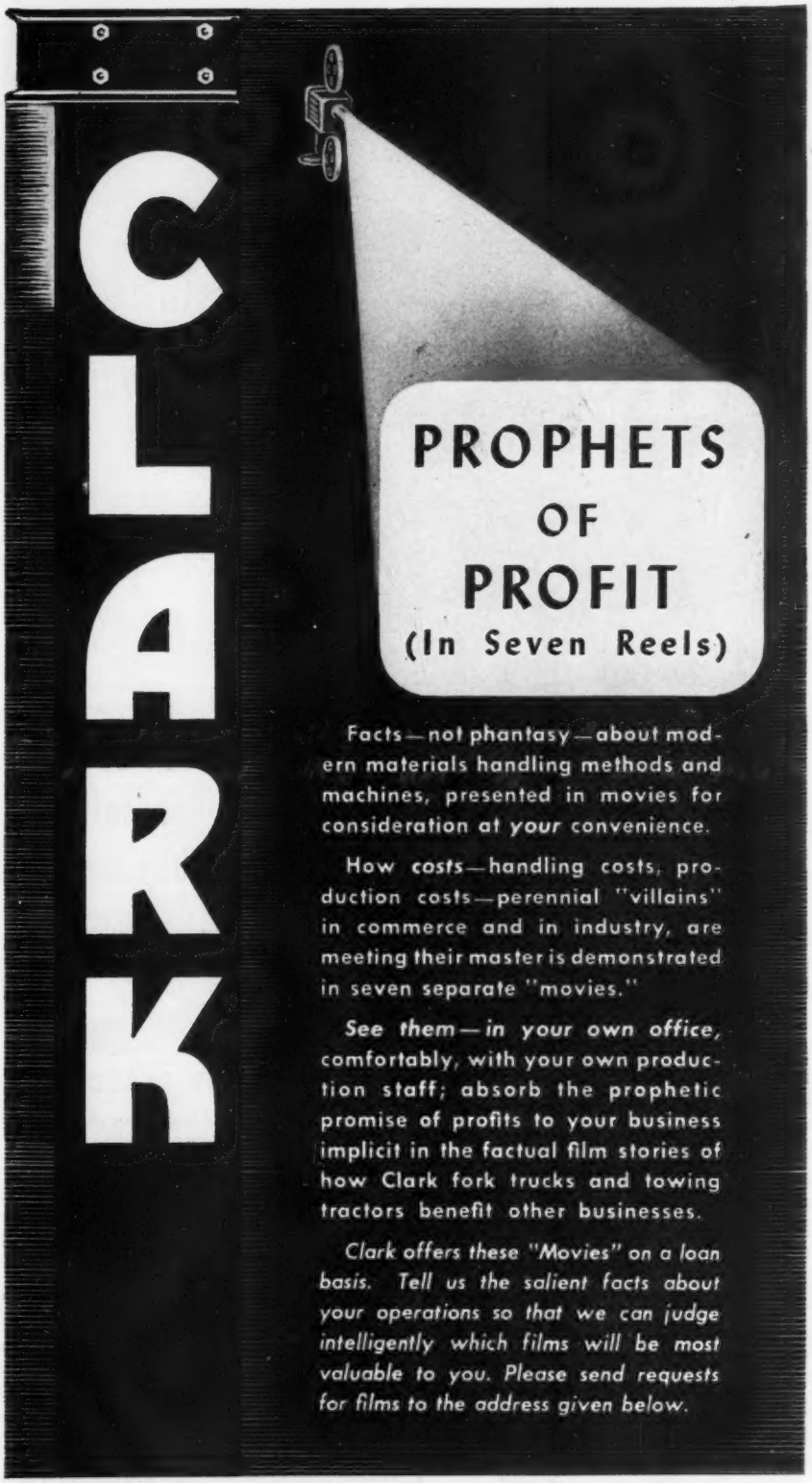
Plate Prices, Page 159

Philadelphia — District plate mills are operating at the highest average level this year, although still short of normal capacity because of inability to obtain an adequate supply of pig iron. Scrap supply is reasonably comfortable, but there is not sufficient iron to create a desirable mix, with a result that even where open hearths are operating full tilt actual production of steel is below what it should be. Notwithstanding relatively high production, however, output continues far short of requirements. Certain producers are becoming somewhat more current on their commitments and, therefore, will have less of a carryover at the end of this quarter, but it is due mainly to their refusal to accept much of the business that is being offered them. Some mills, on the other hand, have made no progress whatsoever, and ascribe some of their difficulty to sustaining operations at contemplated schedules and to inability to make accurate allowances for government-sponsord work. All producers are confronted with far more tonnage in the fourth quarter than they are in position to handle.

New York—While some plate producers will have lighter carryovers at the end of this quarter than three months ago, all indications point to a tighter squeeze in supply for non-preference consumers in the fourth quarter, due primarily to the substantial allocations involved in government-sponsored work. With more than 30 per cent of plate production next quarter scheduled for voluntary allocation programs, the amount of tonnage available for the average buyer will be off rather appreciably from the current quarter, even though voluntary allocations will include fairly substantial quantities which would have gone to preference buyers anyway. Some mills, including one large eastern producer, have not as yet set up consumer quotas for the entire fourth quarter.

Birmingham—Plate supplies, while stringent, are hardly as tight as they were a few weeks ago. Some better balance is noted between supply and demand in the lighter gages. Voluntary allocation programs are hurting miscellaneous users.

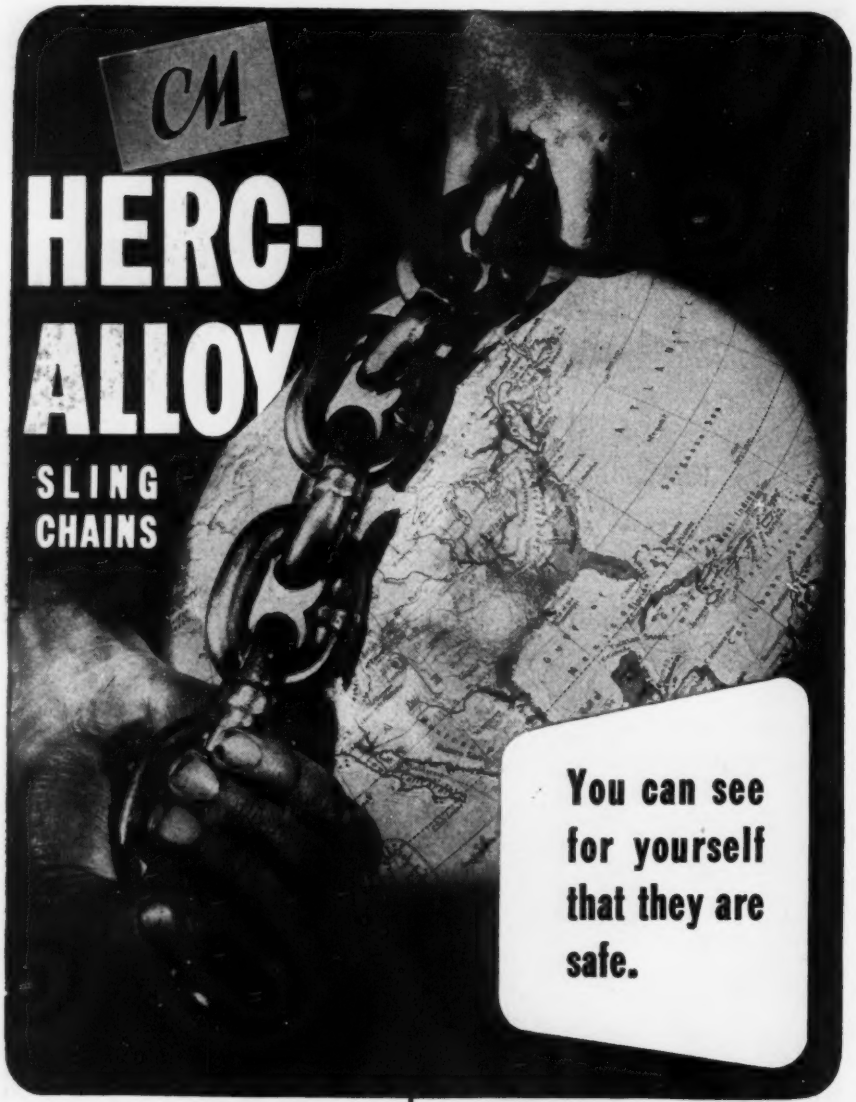
Seattle — Plates are increasingly scarce and plants are making the best of a bad situation. Current operations involve almost entirely small jobs. Columbia Steel Co. has booked 4000 tons steel piling involved in a government breakwater at Astoria, Oreg.


CLARK
PROPHETS
OF
PROFIT
(In Seven Reels)
Facts—not phantasy—about modern materials handling methods and machines, presented in movies for consideration at your convenience.
How costs—handling costs, production costs—perennial "villains" in commerce and in industry, are meeting their master is demonstrated in seven separate "movies."
See them—in your own office, comfortably, with your own production staff; absorb the prophetic promise of profits to your business implicit in the factual film stories of how Clark fork trucks and towing tractors benefit other businesses.
Clark offers these "Movies" on a loan basis. Tell us the salient facts about your operations so that we can judge intelligently which films will be most valuable to you. Please send requests for films to the address given below.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 26, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

THE NATIONAL GUARD DEFENDS AMERICA—JOIN NOW



● Just one of the big advantages of HERC-ALLOY Sling Chains is that you can determine their serviceability by a simple visual inspection.* Ordinary steel or iron chains, on the contrary, grow dangerously brittle with age... an insidious threat to the safety of men and materials. That's why more and more of the important companies are standardizing on HERC-ALLOY Sling Chains... because you can see for yourself that they're safe.

*Write for your copy of this new, informative booklet. No charge.

HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain... first to bear a serial number.
- Every CM HERC-ALLOY Sling Chain is alloy steel throughout... links, rings, hooks. There is only one grade... *the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should *never* be annealed.
- HERC-ALLOY Chains are lighter... stronger... easier to handle... outlast ordinary chains 4 to 5 times... cost less on the job.

HERC-ALLOY... the chain you can *SEE* is safe

COLUMBUS-McKINNON
CHAIN CORPORATION
(Affiliated with Chisholm-Moore Hoist Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

"See us at Booths 826-827 Materials Handling Exposition—Philadelphia—January 10-14"

Steel Bars . . .

Bar Prices, Page 158

Pittsburgh — Alloy bar producers report no let up in pressure from consumers seeking space on rolling schedules for the first half. Some interests have accepted first-quarter orders, but this has not generally been practiced in the industry. At least one producer has received alloy steel orders under the military allocation program for November delivery. Most of this tonnage is for shells. Overall military steel preferred requirements for five-month period beginning in October amount to 40,000 tons monthly. However, mills did not receive specific orders in time for scheduling October delivery. Producers report very little alloy tonnage involved in any of the programs except for military. This program has resulted in a reduction in mill allotments to general consumers of around 10 per cent in bars and plates. Alloy sheets, strip, semi-finished, and ingots generally are not affected by the preferred allocation programs. Poor scrap segregation and greater profit margins of multiple alloy steels are considered major factors behind action of some producers in restricting availability of single alloy steels. Overall supplies of alloys continue tight and no improvement in this situation is indicated over the remaining months this year.

New York — With few exceptions, commercial bar mills have set up quotas for fourth quarter, and one important exception is expected to take action momentarily in establishing consumer quotas for the final two months, in addition to those already set up for October. Hot carbon bar quotas probably will not be off sharply from the current quarter. Voluntary allocation programs, it is estimated, will not take more than four or five per cent of total production, and this in itself does not represent much of an increase from that which has been set aside for some months past. The great bulk of bars scheduled for special allotment in the fourth quarter are for freight cars and repairs, with the amount likely to show little gain over what has been going to car builders for some time past.

Cold bar drawers have long since filled up their schedules for the remainder of this year and, while some of the larger sellers have not committed themselves on tonnage for shipment beyond, others are accepting attractive tonnage for shipment throughout the first quarter and even the second quarter in certain instances.

Philadelphia—Most hot carbon bar consumers in this district will fare reasonably well during the fourth quarter, comparing allotments with those for the period now ending. Government-sponsored programs will take relatively little additional tonnage, so that general buyers do not have too much to worry about on that score. Also, production in the last quarter should be up a little from the current quarter. However, supply will fall short of requirements, as has been the case all along.

One Ohio mill has reduced quotas on hot bars so as to supply more tonnage for its cold-drawing facili-

lies. A Pittsburgh mill and another Ohio mill are having relatively little hot rolled tonnage to offer here, partly for that reason. However, they have not been shipping much hot-rolled bar tonnage into this district for some time, so that the situation next quarter will reflect no marked change in this respect.

Chicago — Demand for bars, alloy as well as carbon, exceeds supply by a wide margin. October quotas for consumers have been shaved to allow for the drain from voluntary allocation programs, and there is fear that November and December quotas will be even lower as the programs develop. Forgers are busy with those serving the farm implement and automotive fields and who are unable to keep up with orders. In contrast, contract railroad car shops are experiencing a sharp drop in new orders, making the future of this business somewhat uncertain.

Wire . . .

Wire Prices, Page 159

Pittsburgh — No let up in demand for most wire products is indicated over remaining months this year, although a slight improvement in supply of some specialty items is noted, such as mattress and bedding spring wire. From a tonnage standpoint, however, this is not considered significant. Merchant items continue in short supply. Many nonintegrated interests complain of wire rod scarcity. One producer in the East is reported to have raised galvanizing extras on manufacturers' galvanized wire. However, the trade in general has not yet adjusted galvanizing extras or base prices on galvanized wire products, except nails, to offset higher zinc costs. Jones & Laughlin Steel Corp. soon is expected to revise nail quotations to a column basis.

Birmingham—Wire products in all specifications remain in short supply, even though the greater part of the outdoor agricultural season is over. Some better balance is evident between supply and demand in spring wire, such as is used by mattress manufacturers, but nails and fencing are two items that are reported especially short.

Tubular Goods . . .

Tubular Goods Prices, Page 159

Philadelphia — One large independent Ohio producer of merchant pipe is withdrawing long established jobber connections here as a result of the industry's shift to the mill pricing system. Adjustments are being made by other producers at various points for the same reason. The leading eastern producer is concentrating more on business nearer its own mills, withdrawing from Pittsburgh and the midwest and also from various sections in the South, it is understood.

Seattle — Portland opened bids last week for 850 tons of 6 to 16-inch cast iron pipe, low being American Cast Iron Pipe Co., $101,610, delivery 20 to 24 months. Award is pending. Agencies are handicapped by delayed deliveries, considerable tonnages being aboard strike-bound intercoastal vessels.

Is HANDLING a Help or a Headache?

MODERNIZE WITH TOWMOTOR MH*

*M H is Mass Handling, the systematic movement of the most units, in the shortest time, at the lowest cost.

Towmotor Mass Handling is a sure cure for handling "headaches." Towmotor Fork Lift Trucks, Tractors and Accessories, gasoline-powered for full-time, full-power service, will increase productive output, provide savings in time, money and space. On every operation, large or small, versatile Towmotor equipment provides all the benefits of modern handling techniques . . . lifting, transporting and stacking materials and products of almost any size, shape or weight . . . helping increase capacity of machines and manpower. And Towmotor Mass Handling is economical, too . . . that's why more *professional handlers*, the men who have to make handling pay a profit, use Towmotor than any other fork lift truck.

Is yours a *special* handling problem? Let Towmotor engineers help you work out special equipment to meet your specific needs. Write for details.

The sturdy, compact Towmotor Model LT-35 handles loads up to 2,000 pounds, operates in complete safety in freight elevators and highway trucks and on upper floor levels where the load limits are restrictive.

SEND FOR FREE BOOK!

New Towmotor Specification Folder contains complete information on all Towmotor Fork Lift Truck models. Send for free copy.

Plan to attend the 3rd National Materials Handling Exposition, Philadelphia, January 10-14, 1949.

TOWMOTOR CORPORATION, Division 16, 1226 E. 152nd St., Cleveland 10, Ohio

REPRESENTATIVES IN ALL PRINCIPAL CITIES IN U. S. AND CANADA

TOWMOTOR *THE ONE-MAN-GANG* **FORK LIFT TRUCKS** *and* **TRACTORS**

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

Tin Plate . . .

Tin Plate Prices, Page 159

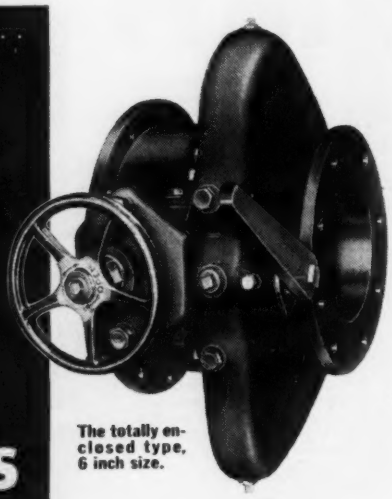
Pittsburgh — The outlook is favorable for sustained production of tin mill products over remaining weeks of this year. Seasonal peak for tin mill product requirements for food packs has been passed. Increase in specifications for general line can requirements has not yet developed as expected. The normal seasonal trend toward lighter coatings, however, should materialize over the next few weeks. Agitation on part of can companies seeking tin plate producers to reduce prices in line with maximum specified under yearly contracts is not expected to be pressed as far as a court battle. Sales departments of leading tin plate producers are hesitant about commenting on this matter, stating that problem is up to their legal departments. Some trade authorities view as significant the delay tin plate producers took in switching prices from the basing point system to pricing at the mill. The legal question in regard to pricing policy specified in annual contracts with can companies is said to have been the major reason tin plate producers delayed in establishing prices at the mill.

Chicago — Tin plate producers report continued heavy demand for their product. This is reflected in requests for larger quotas as well as new inquiry. It is reported that some vegetable and fruit packs may not be as great this year as in 1947, nevertheless, can manufacturers are pressing for uninterrupted flow of tin plate to meet the heavy demand for all types of cans and closures.

FOR THE SAFETY OF YOUR WORKMEN . . .

use Bailey MECHANICAL GOGGLE VALVES

SIZES 6" TO 72"



The totally enclosed type, 6 inch size.

A 60" x 48" Bailey Valve for horizontal gas main.

EASY OPERATING
POSITIVE SHUT-OFF

The powerful clamping device of Bailey Mechanical Goggle Valves assures a gas-tight seal when closed, and prompt, positive freeing of plate when valve is to be opened, regardless of time between operations.

Made in sizes from 6 inches to 72 inches; totally enclosed if desired.

Write for complete details and dimensions of Bailey Mechanical Goggle Valves.

FOR GAS WASHERS, GAS MAINS, COKE PLANTS

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
PITTSBURGH PENNSYLVANIA

Steel Export Prices Revised

New York—United States Steel Export has announced the following base prices, effective according to the dates indicated, with freight included to New York, Philadelphia or Baltimore.

These prices apply on carload lots and are subject to seller's current list of extras and deductions and conditions of sale. All sales are subject to seller's prices in effect at time of shipment.

July 21, 1948	(Per 100 lb)
Cold-finished alloy Steel Bars	$5.51
Aug. 18, 1948	
Fabricated Concrete Reinforcing Bars	5.07
Aug. 26, 1948	(Discount)
National A.P.I. Line Pipe, T & C., random lengths, Buttweld, 2½ and 3-inch	
Black	40.9%
Galvanized	21.9%
Seamless, 3½ to 6-in., incl.	
Black	33.9%
Galvanized	14.4%
American Standard Pipe, T&C., Buttweld, 2½ and 3-inch	
Black	41.9%
Galvanized	22.9%
Seamless, 3½ to 6-inch	
Black	34.9%
Galvanized	15.4%
English Gas Tubes, T & C., Buttweld, 2½ and 3-inch	
Black	41%
Galvanized	25%

Structural Shapes . . .

Structural Shape Prices, Page 159

New York—Structural awards continue to lag, due in part to seasonal influences, but mainly to mounting costs. While various projects are on the active list, a number are being held up at least temporarily pending further clarification as to the trend in building costs. At the moment more public work, relatively, is active than private work. An outstanding public project involves 14,000 tons for a state viaduct in Queens county, this city.

Philadelphia—Decline in structural activity is being cushioned by public work, principally bridge work. Various private projects are pending, with one fairly good sized job expected to be awarded momentarily, but over recent weeks commercial demand has fallen off rather appreciably. High costs and uncertainty as to the future trend are mainly responsible for the easing situation, although seasonal influences are contributing some and, also, the fact that deliveries are so far extended. Most fabricating shops are booked solidly into next year.

Birmingham — Fabricators are steadily engaged on a variety of relatively small projects, but there is

increasing evidence of demand for shapes being concentrated on public projects. Delay in delivery of steel has hampered some important construction, including the new Birmingham City Hall.

Seattle — Fabricators are restricted by limited inventories, the tight supply situation having been aggravated by the maritime strike, considerable steel being en route and delivery delayed. Plant operations are measured by the amount of material available and, consequently, major projects are not being sought.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 158

Seattle — Rolling mills are operating at maximum capacity in an effort to speed deliveries and reduce backlogs. Pressure for small tonnages of reinforcing bars continues in spite of higher prices and many offers are refused because it is impossible to handle them. Regular customers are being cared for as operations permit. The price of fabricated bars to consumers has been raised from 4.85c to 5.00c. Mills are not guaranteeing prices beyond the end of 1948 and are cautious in taking first quarter business.

Stainless Steel . . .

Pittsburgh — New base price and extras schedules established by Allegheny Ludlum Steel Corp. on stainless steel reflect a study of operating costs which was under way at the time the company announced a 10 per cent interim advance last August. Base prices on bars, wire, shapes, plates, sheets and strip have been reduced varied amounts (depending on grade and product) on chrome-nickel steels ranging from 1/4 to 4-1/4 cents per pound. A few grades were not changed while the greatest decreases generally are applicable on sheets and cold-rolled strip. Base prices on straight chrome series were advanced an average of 1 cent per pound with some grades remaining unchanged; a few were decreased.

Adjustments in gage, finish, quantity, size, and circling extras were made to more accurately reflect mill operating costs. These extras differ in some respects to those established by other producers, notably on size, gage and finish extras.

Philadelphia — Further adjustments in stainless steel price lists of some mills have been made recently so as to make them more competitive, and certain other mills contemplate adjustments. Various mills had revised lists initially last month, in some instances adding a flat increase of 10 per cent or so to previous schedules, but in general there was no broad uniformity and, as time went on and others announced new lists and pricing policies, there was a further lack of uniformity, particularly with regard to various extras, with a result that the market has since been in a high state of confusion, with competitive factors off balance.

New York — Effective Sept. 15, Armco Steel Corp. has discontinued jobber discounts on shipments of stainless to warehouses and has reduced allowances on distributor orders for shipment direct to their customers. The reduction in allowances on sheets, plates and bars is from 10 to 7-1/2 per cent and on cold-rolled strip and wire, from 7½ to 5 per cent.

Changes were also made in extras, particularly quantity extras, with the base quantity on sheets and plates reduced from 40,000 pounds to 10,000 pounds. Further details are yet to be announced.

Bolts, Nuts . . .

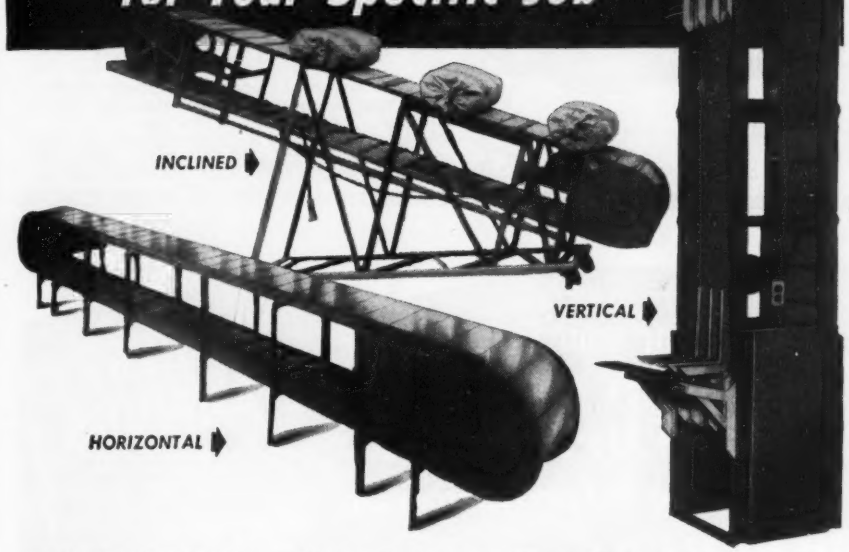
Bolt, Nut, Rivet Prices, Page 159

Pittsburgh — Some producers of fasteners continue to quote prices on the old price basis of Pittsburgh, Cleveland, Chicago and Birmingham; others have established mill prices with proviso they will reserve the right to meet competition when they desire. This confused pricing structure within the industry is expected to continue for an indefinite time. Overall demand for fasteners has eased somewhat in recent months, a condition forcing many interests to frequently adjust prices to competitors' levels. Order backlogs average about three months, with large diameter items available within three to four weeks. Deliveries for cold-headed products, particularly in small size range of 1/2 to 5/8-inch, are ex-

STEEL PARTS STEEL BELT CONVEYORS

PRE-ENGINEERED

for Your Specific Job



PRE-ENGINEERING makes Steel Parts steel belt conveyors easy to install, operate and maintain — and their flexibility suits them to your specific job. Whether you're installing a single conveyor or an entire system, consider the cost-saving advantages of steel belt conveyors — a flat, sagless surface of steel, easy to clean, sturdy and rugged. Write for details today.

Certain choice territory still open. Qualified representatives are invited to write for information.

Here's What Steel Belt Conveyors Did for One User

1. Production efficiency UP 30%.
2. Unit cost DOWN 10%.
3. Machine capacities UP 65 to 95%.
4. Operating space CUT 58%.
5. Waste REDUCED by 5%.

GET THE COMPLETE STORY

Mail This Coupon Today

STEEL-PARTS MFG. CO.
2136 W. Harrison St., Chicago, Ill.

Please send me complete information including engineering data and specifications on your Steel Belt Conveyors.

Please have your representative call to discuss our specific materials handling problems.

NAME_____ POSITION_____

FIRM_____ ADDRESS_____

CITY_____ STATE_____

STEEL-PARTS
MANUFACTURING CO.
DIVISION OF BLACKSTONE MANUFACTURING COMPANY

MATERIALS-HANDLING EQUIPMENT

THAT SPEEDS WORK, SPARES MEN, SLASHES COSTS

No other Mobile Crane of this type has all the features of ***KRANE KAR***. More goes into ***KRANE KAR*** . . . you get more out of ***KRANE KAR*** . . . more speed, more work, more safety. Loads and Unloads freight cars, trucks, trailers . . . Stacks and Stores . . . expedites Plant Maintenance.

KRANE KAR handles steel stock and forms of any shape or size within capacity (or scrap when equipped with magnet); transmission cases, motors, crankcases, transformers, etc. Works in tight quarters, low headroom, up and down ramps . . . anywhere, in plant or yard. Often cuts handling costs to 8¢ a ton.*

Safest Crane in its class, minimizing injury risks to men, materials, machine. ***Self-Stabilizing***: dangerous use of jacks or stabilizers eliminated. ***Automatic Power Cut-Off*** at extreme positions of Boom-Swing or Topping. ***Automatic Braking*** of Load and Boom Lines. ***No Tail-Swing***: no part of Crane passes over operator's head.

Gas or Diesel. 9 to 37 ft. booms or adjustable telescopic booms; Electric magnet, clamshell bucket, and other accessories available. Ask for illustrated bulletin #79.

USERS: General Motors, Bethlehem Steel, Boeing, Pullman-Standard, Lima Locomotive, Carnegie-Illinois, U. S. Steel, Basic Magnesium, etc.

KRANE KAR *will transport any load it can lift—at sides as well as at front.*

THE ORIGINAL SWING-BOOM MOBILE CRANE
WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER
1½, 2½, 5, AND 10 TON CAPACITIES

KRANE KAR
TRADE MARK REGISTERED

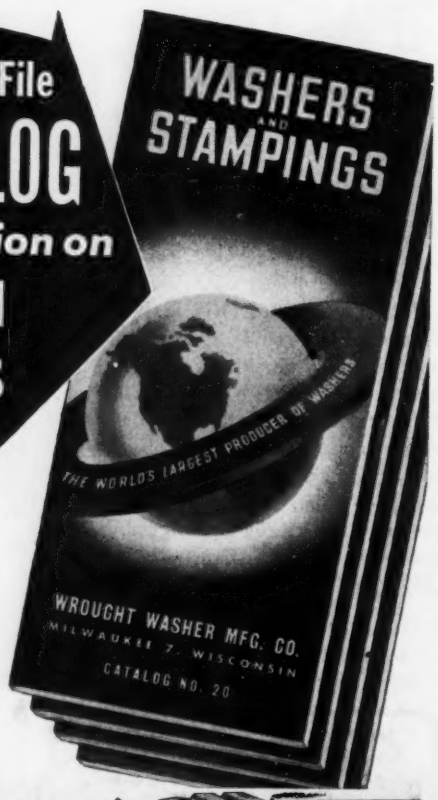
SILENT HOIST & CRANE CO., 849 63rd St., BKLYN 20, N.Y.

Available for your Data File

Valuable CATALOG

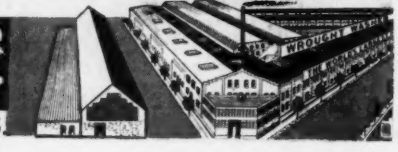
Complete Information on

WASHERS and STAMPINGS



Here's a pocket edition catalog made to order for those engaged in the selection and purchase of washers and stampings . . . forty-six fact-packed pages of worth-while descriptive material, including illustrations of many of the more than 22,000 dies available in our plant to save you unnecessary die charges and delay. Write for your free copy, today. It will be sent to you without cost or obligation. Ask for Catalog No. 20.

WROUGHT WASHER MANUFACTURING CO.
The World's Largest Producer of Washers
2103 S. BAY ST., MILWAUKEE 7, WIS.



tended more than three months. Indicated reduction in steel allotments for fourth quarter may force a slight reduction in output of fasteners during this period.

Pig Iron . . .

Supply situation improves in some districts, but generally remains tight

Pig Iron Prices, Page 160

Chicago — Iron supply in this district should improve moderately soon with Youngstown Sheet & Tube Co.'s scheduled lighting late last week of its No. 1 1400-ton blast furnace at Indiana Harbor, Ind. When this unit starts supplying hot metal for steelmaking, it will be unnecessary to import metal from its three blast furnaces at South Chicago, thus releasing this iron for merchant use. Lighting of the new stack will raise to 39 the active furnaces in the district. Meanwhile, foundries are melting at rates allowed by restricted iron supply. They have gone as far as they can in scrap makeup and are obliged to schedule melts according to iron shipments. Coke supply is sufficient for the moment.

Pittsburgh — Overall pig iron supply available to foundries not coming within the scope of the Federal housing program is expected to be adversely affected by increase in shipments indicated for foundries serving the housing industry. Downward trend in new orders booked by gray iron jobbing foundries making light castings is one factor that has partially offset the critical merchant pig iron supply in the Pittsburgh area. Many of these interests have been forced to use substantially larger proportion of scrap in melting operations, which has substantially increased their operating costs. Merchant iron producers report little improvement in furnace output in recent weeks, due in part to poor quality coke. Overall pig iron output in the Pittsburgh district has been curtailed somewhat with the blowing out of Jones & Laughlin Steel Corp.'s No. 5 unit. This unit has a 20-foot hearth rated at 800-ton capacity. It will be completely rebuilt, with the hearth increased to 24 feet and capacity boosted to 1000 tons. There are 43 out of 47 blast furnaces currently active here.

New York — While falling short of requirements, pig iron shipments to district foundries are slightly heavier than a month ago. Domestic shipments are being augmented in increasing degree by foreign receipts, although imported iron is expensive and customers are buying cautiously. Foreign prices range around $85 to $90 on iron that can be used by district foundries—c.i.f. seaboard, plus inland freight, in various cases. Actually some foreign iron is being offered here in excess of $100 c.i.f., although no sales have been reported.

Most foundries have a fair supply of oven coke on hand, but are concerned about possibility of an increasing stringency over the fall and winter months.

According to word here, the Lone Star stack, Daingerfield, Tex., will

resume production Sept. 20 after suspension lasting several weeks for repairs.

Philadelphia — A shift in the program of the Swedeland, Pa., merchant producer is resulting in a curtailment in iron shipments to a number of district foundries. The cut in quotas amounts to about 50 per cent of what was originally contemplated. This is ascribed to the need of supplying more basic for the company's own open-hearth department. Normally this department takes a certain amount of iron from its merchant furnace, and, when the latter was down for a period of about two months during the summer, open-hearth inventories suffered. This, combined with the fact that another open hearth is now being put into operation, is causing diversion of some of the iron production originally contemplated for the foundry trade. However, next month should witness a full return to normal foundry quotas for the first time since early summer.

Buffalo — Lack of railroad cars has developed into a real problem for pig iron producers and hard-pressed foundries. While the majority of foundries are working on a hand-to-mouth supply basis, one leading iron producer has been piling iron for two weeks because of the car shortage. In addition to the shortage, shippers report that many of the cars coming through are in poor shape. Breakdowns are reported in many instances before cars have scarcely left their loading points.

The outlook for an increase in shipments to New England users remains dark. With producers unable to take care of nearby consumers the total tonnage of iron moving to eastern buyers is estimated at about 25 per cent of the amount shipped in normal periods.

Cincinnati—Supplies of northern and southern pig iron to district foundries continue so tight that melters see slight chance for expansion. Shortages of manpower, scrap and coke which hampered output last year are nearer solution than the pinch in pig iron. Demand for castings is well sustained but pressure may have relaxed in recent months. However, any increase in machine tool work would again put heavy strain on pig iron supplies.

Birmingham — Pig iron supplies are far from adequate to take care of local and regional needs. Pipe plants and foundries are short, as they have been for months, and see no prospect for real relief. The disparity between supply and demand is gradually widening throughout the southern district.

St. Louis — The pig iron situation here is steadily worsening as consumers dip further into ground stocks hastily built in anticipation of the curtailment of Missouri-Illinois Furnaces operations for repairs. Fifty per cent of the company's capacity will be down until about Oct. 26. Some melters in extreme circumstances are reported paying $79.20, f.a.s. New York harbor, for foreign iron, putting their delivered cost near $90. Imported tonnage is not substantial yet, but is picking up. Some Texas iron is coming in. A few of the smaller foundries are predicting curtailments soon, already having increased the scrap content of their mix to the limit. The district's leading steel mill is down to 32 per cent pig in the mix, against 46 per cent in July, as a result of Missouri-Illinois Furnaces' temporary rationing system.

Seattle — Fundries report sufficient receipts of cast iron scrap to meet current needs which are above normal in view of the shortage of pig iron. Local buyers have not been advised when pig will be available again in sizable lots. Present receipts are confined to small shipments. Cast iron scrap is nominally $40, although $2 or more premium is being paid for choice lots. Eastern buyers are in the area and their operations are firming prices.

Reports on Far Eastern Scrap

Seattle—H. B. Keisler, vice president Dulien Steel Products Inc., has returned from a business survey trip to the Philippines, China and Japan. He reports large scrap supplies in Japan, much of it accumulated industrial material, including a large proportion of alloys. Already 130,000 tons have been sold for delivery on the United States Atlantic seaboard. In the Philippines, much scrap, both military and industrial, is available but labor conditions for collecting and processing it are not too favorable. The market in China is impossible under present conditions, he says, not much material being available in that area.

a basic economic principle...

Whenever a product becomes in great demand . . . mass production follows and goods are stocked on the shelf for immediate sale and delivery.

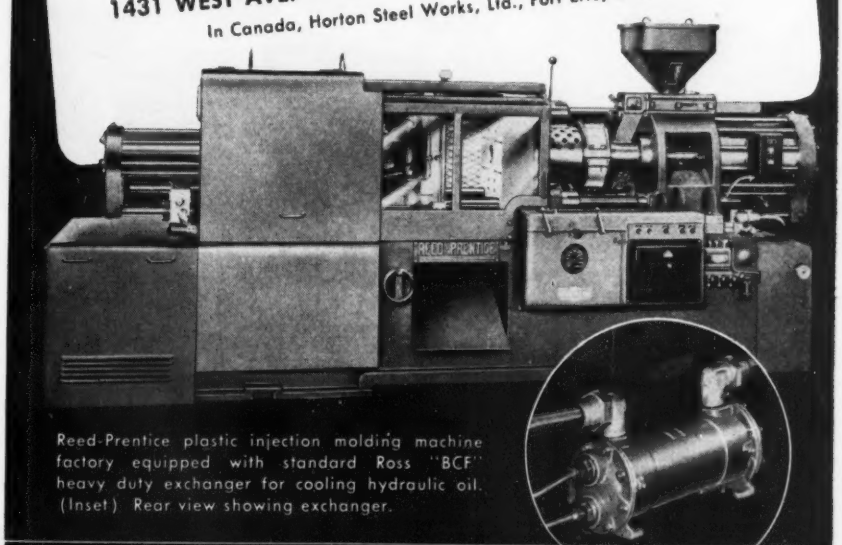
is now applied to heat exchangers

Like a valve, a pump or a bolt, *Ross "BCF" Exchangers* are now carried in stock for immediate shipment to manufacturers of hydraulic and other primary equipment.

ROSS "BCF" EXCHANGERS

*For the complete story on the new "BCF", write for new catalog 1.1K1.

Ross Heater & Mfg. Co., Inc.
Division of American Radiator & Standard Sanitary Corporation
1431 WEST AVE. BUFFALO 13, N. Y.
In Canada, Horton Steel Works, Ltd., Fort Erie, Ont.



Reed-Prentice plastic injection molding machine factory equipped with standard Ross "BCF" heavy duty exchanger for cooling hydraulic oil. (Inset) Rear view showing exchanger.

Serving home and industry— AMERICAN STANDARD • AMERICAN BLOWER
CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILER • ROSS HEATER • TONAWANDA IRON

SHEAR IT CLEVERLY WITH A

BEVERLY
THROATLESS SHEAR

●Handles intricate cuts easily. No distortion. Unusually strong and durable, geared to give great power with little effort. Metal can turn any direction while cutting.

●Machines available for 14 ga., 10 ga., and 3/16 in. material.

●Available with or without stands.

BEVERLY SHEAR MFG. CO.
3011 West 111th St.
Chicago 43, Ill.

Write for folder today!

Sculpture In Steel . . . Master Hobs—delicately detailed in HSC 422 alloy tool steel—preferred for its toughness and hardness—for its ability to retain shape, design, sharp delineation, under extreme pressures.

An unusual assortment of fine tool steels . . . in various sizes, shapes, finishes, conditions . . . available promptly from the conveniently located warehouses of Hoyland Steel Company. Complete technical assistance in solving tool steel problems. Hoyland Steel Catalog-Work Book available on request.

DISTRIBUTORS

HOYLAND STEEL COMPANY, INC. 405 Lexington Ave., New York 17, N.Y. • GRAMMER, DEMPSEY & HUDSON, Inc. 212 Rome Street, Newark 5, N. J. • ACHORN STEEL COMPANY, 381 Congress Street, Boston 10, Mass. • GREAT WESTERN STEEL CO. Inc. 1011 East 61 Street, Los Angeles 1, Cal.

Scrap . . .

Mixed feelings prevail in the Buffalo market with dealers bullish

Scrap Prices, Page 164

Buffalo — Mixed feelings prevail in the scrap market here. Mills maintain the market is merely holding steady at current levels, while dealers hold a strong undertone is apparent. Dealers continue to ship against old contracts placed at the formula of $42.25 a ton for No. 2 heavy melting. To support their bullish feeling, dealers point out that mills have standing bids for new contracts at present prices as soon as orders are completed.

Battlefield scrap continues to arrive here from the seaboard by barge via the canal. Nearly 10,000 tons of war scrap has been received so far as additional barges came in during the week for Bethlehem's Lackawanna plant.

Local dealers contend that prices being quoted on No. 1 heavy melting in other areas are out-of-line with prices at which actual business is being consummated. The market for No. 1 material here has zoomed to $48 to $48.50 with some rail offerings bringing slightly higher prices. Complaints about No. 1 prices elsewhere were heard when an outside buying interest entered the market here with a bid close to the $50 mark, or about $7 above the price quoted for No. 1 in the area of the buyer's plant.

Philadelphia — Eastern steel scrap consumers are in a more comfortable supply position than they have been in months. Domestic shipments have been freer and substantially more tonnage is coming in from abroad. However, consumers are still interested in taking in all the steel scrap offered at going prices as they are anxious to build up inventories for the winter season.

Thus, under the circumstances, steel scrap prices continue generally steady despite the freer movement of tonnage. Actually, some special lots of prime quality railroad steel have been picked up at premiums, but these instances are spotty.

The leading eastern consumer brought in a cargo of German scrap here last week and expects to receive three more before the month is over and also possibly another one, making two, in New York. At the moment, this interest has six cargoes of German scrap enroute; also ten full and split cargoes are enroute from the Pacific.

The new Penn Ohio Steel Co., which earlier in the summer leased a Navy plant at Birdsboro, Pa., is now inquiring for No. 1 and No. 2 heavy melting steel for two open-hearth furnaces which are now being readied for production. Negotiations are being made through representatives of a Cleveland scrap concern with offerings at premium levels.

The general market on all grades of scrap, including cast, is unchanged.

New York — Scrap brokers' buying prices are unchanged throughout the list. Demand is still active for all grades of open-hearth steel, although current arrivals of foreign scrap, particularly German material

along the eastern seaboard is easing the pressure somewhat.

Chicago — Activity in the scrap market is a little stronger than a week ago, but has not yet returned to the level preceding Labor Day. Shipments are in good volume and most consumers are in a reasonably good inventory position. Steelmaking grades are adhering to formula prices; railroad grades are limited and are maintained at recent levels. Foundries are displaying little interest, having comfortable stocks and not being disposed to lay out capital at present high prices to expand these stocks.

Cincinnati — Although scrap prices are unchanged, a softening tendency developed in the market last week. Some major outlets, with 60 to 90-day stocks, show little interest in further buying. Foundries which are comfortably fixed in scrap stocks are likewise buying little. Complaints on the quality of scrap being shipped are increasing. In contrast, reports sifting into this district indicate high bids are still being offered for scrap used in conversion deals.

St. Louis — Scrap market remains extremely quiet. Cast grades are showing the only activity of note, with prices under alternating upward and downward pressure. Demand for cast is aided by curtailment in local pig iron sources, but big users at the moment have fair stockpiles. When a few substantial melters catch up on inventories, the price weakens fast. Somewhat more than usual tonnages of cast were offered last week. Mills' steel scrap inventories are down a bit, but few have less than 30 days' supply. Their current worry is that they should be beginning to gain in reserves at this season. Scrap shipments have been low many weeks and brokers do not anticipate a pick-up before October.

Seattle—While steel scrap is arriving at plants in fairly sizable volume, the future is viewed with some apprehension with the approaching unfavorable weather and consumption at an all-time high in this area. The bulk of surplus ships has been broken up and the supply of this material is expected to be severely limited shortly. Steel scrap is firm at the new level of $27.50 per gross ton.

Pittsburgh — Little revision in scrap prices has developed in recent weeks, with bulk of shipments going at the formula levels. Reported sales of small lots at prices above the formula cannot be confirmed, while mills are being more selective in purchase of remote scrap involving freight shipments above the theoretical springboard. Mills also continue to more closely inspect shipments in regard to meeting specific grade classifications. In this connection, one large mill will lift the ban Sept. 20 on shipment of No. 2 bundles from a selective list of suppliers who are expected to ship good quality material. Only price revision last week was an upturn in specialties in the Pennsylvania Railroad list at about $61.50.

Trade opinion on the plant for a central buying agency for handling German scrap continues mixed, but more interests appear to favor the proposal.

CEILCOTE CORROSION PROOFING

Including Acid & Alkali Proof Linings
Acid & Alkali Proof Brick & Cements
Acid & Alkali Proof Coatings

When installed in the proper combination under complete contract or our supervision will give years of maintenance free operation.

BACKED BY 25 YEARS EXPERIENCE

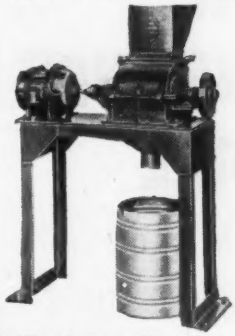
We will be pleased to submit recommendations and estimates on pickling, storage, and neutralizing tanks, as well as fume duct linings, acid pits, floors, sewers, and sumps at no obligation.

Write for further information and complete catalog.

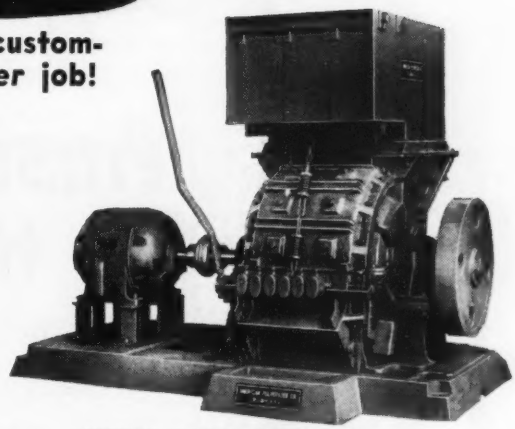
CEILCOTE
THE CEILCOTE COMPANY
Corrosion Proof
Materials - Construction - Supervision
ROCKEFELLER BUILDING CLEVELAND 13, OHIO

from TEST GRINDING to TONNAGE CRUSHING

AMERICANS are custom-built to do a better job!



AMERICAN Laboratory Size Mills
With the same reduction action as Metal Turnings Crushers (or hammer action)—American Laboratory Size Mills offer an efficient means for reducing razor blades, pewter castings and fragile, thin brittle steel to a reclaim product.



AMERICAN Metal Turnings Crushers
Bulky, hard-to-handle turnings are rapidly reduced as much as 80% with this efficient, economical crusher. And the yield of cutting oil is increased 30 to 50 gallons per ton—proof of how profitable the installation of an American Metal Turnings Crusher can be for those who handle 20 tons or more of metal turnings a month.

There's a custom-built AMERICAN for your operation—write for further data and specifications.

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1539 MACKLIND AVE.
ST. LOUIS 10, MO.

McDANEL
High Temperature COMBUSTION TUBES

for use in Metallurgical Laboratories

OTHER McDANEL PRODUCTS

High Temperature Combustion Tubes.

•

Self-cooling Combustion Tubes.

•

Refractory Porcelain Specialties in stock or designed to meet specific needs.

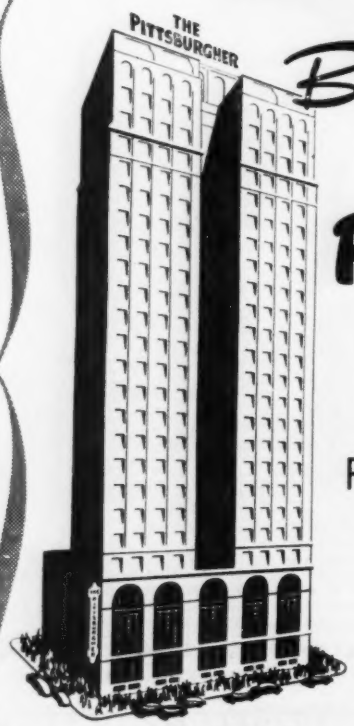
McDanel Combustion Tubes are precision made under rigid laboratory control to assure proper density, accurate bore size, wall thickness, etc. They have a low coefficient of expansion and maximum resistance to thermal shock and abrasion. Now giving outstanding service in metallurgical laboratories throughout the country. McDanel Combustion Tubes are carefully ground for stopper thickness.

Straight, tapered or double reduced self-cooling ends.

Write for catalog

Specify McDanel High Temperature Combustion Tubes from your supplier.

McDanel Refractory Porcelain Co.
Beaver Falls · · · Penna.



Busy people choose

THE PITTSBURGHER HOTEL

In the heart of Pittsburgh's Golden Triangle ... near the important office buildings, stores and theatres.

JOSEPH F. DUDDY, Manager

A Knott Hotel

Warehouse . . .

Warehouse Prices, Page 161

Pittsburgh—Most distributors have not received official decision on the part of mills in regard to fourth-quarter mill allotments. On the basis of scheduled curtailment of 5 to 10 per cent in these allotments to consumers not coming within the preferred allocation programs, similar adjustments likely will be made for warehouse accounts. However, mills are under pressure to aid small manufacturers and, on the basis of this, steel distributors may be given some preference on mill allotments through the rest of this year. Not all steel distributors have dropped the functional discount to jobbers on stainless steel products. In some instances such action is not likely for jobbers represent the sole distribution outlet for some producing interests and, in other instances because of long term contract agreements. Those distributors affected by the abandonment of the mill functional discount have not yet established pricing policy in regard to stainless.

Birmingham — Warehouse reports indicate an effort on the part of mills to bring their inventories in somewhat better balance, although the situation is far from satisfactory. Some improvement in plates is noted.

Ferroalloys . . .

Ferroalloy Prices, Page 161

New York — New Jersey Zinc Co. has advanced spot spiegeleisen, 19-21 per cent, $5 a ton, to $62 Palmerton, Pa., effective Sept. 10, with this price to become effective Oct. 1 on contracts. Spot 16-19 per cent material also has been advanced $5 a ton, to $61 Palmerton. These changes represent the second $5 increase on spot sales within a month, previous advances having been made effective Aug. 16. As there were no changes in contract prices last month, the new quotations Oct. 1 will represent an increase of $10 on the long-term transactions.

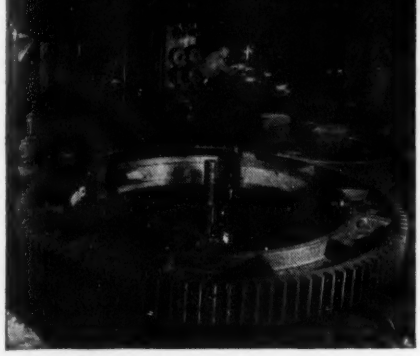
Holds Open House

YOUNGSTOWN Sheet & Tube Co. conducted open house at its two plants in Indiana Harbor, Ind., Sept. 15. One tour was through the steel plant and the other through the tin mill, giving visitors an opportunity to see the complete process from molten iron to finished steel. An exhibit in the tin mill laboratory building provided a wide range of finished goods made from the company's steel products.

It was 25 years ago this summer that the name Youngstown first became linked with the Calumet district. In mid-1933, the company purchased Steel & Tube Co. of America, which had operated in Indiana Harbor for several years. Today, the company employs nearly 7000 persons in the Chicago district.

Heavy-Duty

GEARS



Cutting the teeth in a large diameter spur gear in the Simonds shop.

LARGE GEARS

OF ALL TYPES

up to 12 ft. dia.

When you need large or heavy-duty gears for new industrial equipment—for special machinery—for repairs or replacements—call on SIMONDS GEAR where they have been a specialty for more than 50 years. SIMONDS GEAR assures you of personalized attention to your specific requirements—faithful reproduction of your most exacting specifications—and faster service because SIMONDS' production is geared to specialized work. For all types of heavy-duty gears ranging to 145" dia. in materials including cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite—send your inquiry to SIMONDS GEAR.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.

LIBERTY at 25TH PITTSBURGH 22, PA

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1000 tons, conveyor work, plant, American Gas & Electric Co., Graham Station, W. Va., to Lehigh Structural Steel Co., Allentown, Pa.

1000 tons, Hungry Horse project, Montana, to Consolidated Steel Co., Los Angeles.

445 tons, Pabst Brewery, Irvington, N. J., to Bethlehem Steel Co.

400 tons, towers and cables, Hungry Horse project, to Consolidated Steel Co., Los Angeles.

320 tons, bridge, Sec. 11X-F, Monticello, Ill., for State Highway Division, to Illinois Steel Bridge Co., Jacksonville, Ill.; bids July 30.

320 tons, 6-story office building, Hartford, Conn., to Bethlehem Steel Co.

300 tons, state bridge, Herkimer county, New York, through Lane Construction Co., to Bethlehem Steel Co.

273 tons, Phillip-Sheridan school, Union Free School District No. 1, Tonawanda, N. Y., to the R. S. McMannus Steel Construction Co. Inc., Buffalo; John W. Cowper Co. Inc., Buffalo, general contractor.

225 tons, warehouse, General Electric Co., Waterford, N. Y., to the Haarmann Steel Co., Holyoke, Mass.

200 tons, telephone exchange, Jersey City, N. J., to Weatherley Steel Co., Weatherley, Pa.

172 tons, building, Coca Cola Bottling Co., South Bend, Ind., to American Bridge Co., Pittsburgh; bids Aug. 27.

150 tons, Delaware & Hudson bridge, Whitehall, N. Y., to American Bridge Co., Pittsburgh.

142 tons, bridge, Proj. T-024-1(1), Vilas county, Wis., for state, to American Bridge Co., Pittsburgh; bids Aug. 20.

140 tons, New York Central bridge repairs, Lyons, N. Y., and Toledo, O., to Bethlehem Steel Co.

101 tons, bridge, Cont. F 014-3(1), Racine county, Wis., for state, to Lakeside Bridge & Steel Co., Milwaukee; bids Aug. 20.

STRUCTURAL STEEL PENDING

14,000 tons, Meeker Ave. link viaduct, Kings county, New York, bids to be opened by the New York State Department of Public Works, Oct. 13.

2635 tons, veterans hospital, Denver, for U. S. Veterans Administration; Del Webb Construction Co., Los Angeles, low on general contract; bids Aug. 30.

1160 tons, overpass, Elsmere, Md.; J. A. Bader Co., Wilmington, Del., low on general contract.

800 tons, Divine Providence Hospital, Williamsport, Pa.; bids postponed until Sept. 24.

500 tons, building, Cincinnati Gas & Electric Co., Cincinnati; Day & Zimmerman, Philadelphia, engineers in charge.

400 tons, state bridge work, York county, Pennsylvania; bids Sept. 22.

400 tons, state bridge work, Delaware county, Pennsylvania; F. A. Canuso & Son, Philadelphia, awarded general contract.

360 tons, section No. 52, Battery Park underpass, lower Manhattan, New York, bids Sept. 28; a substantial but unstated tonnage of reinforcing steel will be required.

300 tons, roof construction for a wing of the Senate building, Washington; bids asked.

200 tons, extension, Pennsylvania railroad pier No. 1; bids Sept. 22.

150 tons, Public School No. 2, Jerusalem, Long Island, bids Sept. 21; a modest tonnage of reinforcing steel will also be required.

Unstated tonnage, municipal Gansevoort Meat Market Center, West St., lower Manhattan, New York, bids Sept. 23; a substantial tonnage of reinforcing steel will also be required.

Unstated tonnage, Naval Hospital addition, St. Albans, Long Island, bids asked Sept. 23 on revised specifications; recently contractors' bids were rejected as estimates exceeded appropriations; structural steel required originally amounted to around 3000 tons.

Unstated, string yokes; Young Iron Works,

HOW 1 MAN Does the work of 3

Here's how one plant saved production hours and dollars—simply by reviewing their materials handling operations.

It took two men to carry pots of molten metal from furnace to pouring room. Then it took a third man to pour the metal. A *Reading Engineer* analyzed the operation and recommended a ½-ton Electric Hoist on a monorail running *directly* from furnace to pouring floor. Now the job is handled by one man—in less time—and at far less cost!

To start reducing your own costs, let a *Reading Engineer* review your handling operations. At no obligation he'll give you suggestions that can lead to better, faster materials handling. Call or write for full details, now.

READING CHAIN & BLOCK CORPORATION
2102 ADAMS ST., READING, PA.

CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

Seattle, $15,592, low to Bonneville Power Administration.

Unstated, steel frame power house, traveling crane, etc., Waterville hydroelectric project, Eugene, Oreg.; Minnis & Schilling, Eugene, Oreg., low, $239,589.

Unstated, 185-foot state bridge, Lewis & Clark county, Montana; bids to Helena, Sept. 16.

Unstated, material for Grand Coulee pumping station; bids to Bureau of Reclamation, Sept. 30; Sch. No. 2408.

PLATES . . .

PLATES PLACED

4000 tons, steel piling government breakwater at Astoria, Oreg., to Columbia Steel Co., Portland; Macco Corp. general contract.

1550 tons, municipal water main, Queens, New York, to American Locomotive Co., New York.

PLATES PENDING

300 tons, piling for Washington state Agate Pass bridge; bids to Olympia, Oct. 1.

220 tons, hull plates, navy, east and west yards, inv. 6681, bids Sept. 27.

109 tons, floor plate, navy, east and west yards, inv. 6679, bids Sept. 24.

Unstated, 2625 feet 22 inch, 10 gage, steel pipe for Washington state hatchery; bids to F. A. Pokswin, purchasing agent, Olympia, Sept. 16.

Unstated, 66-inch outlet pipe and appurtenances, Cascade dam, Idaho; Humphrey-Kitchner Co., Boise, low to Bureau of Reclamation, $39,901.

REINFORCING BARS . . .

REINFORCING BARS PLACED

365 tons, substructure, state bridge, Annisquam river, Gloucester, Mass., to Truscon Steel Co. and Northern Steel Co., Boston; Coleman Bros., Boston, general contractor.

200 tons, Hungry Horse project, Montana, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

600 tons, Technical and vocational high school, Hammond, Ind.; Joseph J. Duffy Co., Chicago, low on general contract.

550 tons, North Shore intercepting sewer, Cont. No. 7, Chicago Sanitary District, Chicago; Paschen Contractors Inc., Chicago, low on general contract; bids Sept. 2.

200 tons, high school Kirkland, Wash.; Wick & Dahlgren, Seattle, general contract.

180 tons, building, Murphy Stores Inc., Ft. Wayne, Ind.; bids Sept. 9.

175 tons, state bridge, over Barnegat Bay, between Island Heights and Seaside Heights, N. J., bids Sept. 30.

110 tons, Washington state bridge; bids to Olympia, Sept. 24.

Unstated, $5 million veterans hospital, Seattle; bids postponed from Sept. 17 to Sept. 28.

Unstated, veterans' hospital, Miles City, Mont.; Lease & Leighland, Seattle, low base bid, $4,170,000.

PIPE . . .

CAST IRON PIPE PENDING

850 tons, 6 to 16 inch, for Portland, Oreg.; American Cast Iron Pipe Co., low, $101,610.

STEEL PIPE PENDING

Unstated, 30,000 feet 3 to 8 inch for King County Water District No. 81, Kirkland, Wash.; general contract to Stateside Construction Co., Seattle, $25,470.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 50 seventy-ton gondolas, to Pressed Steel Car Co., McKees Rocks, Pa.

Wabash, 600 fifty-ton box, to own shops, Decatur, Ill.

Weldimatics
WELD IT WITH WELDIT EQUIPMENT SUPPLIES
WELDING TORCH W-45
Strong and sturdy, 14 inches long, yet weighs only 17 ounces. Lock control for continuous welding. Cuts oxygen and acetylene costs one-third.
BLOWPIPE C-47
Aluminum alloy construction... good balance, comfortable grip. Closed hand releases gas ... open hand cuts it off. Reduces idle flame fire hazard. Works perfectly with natural gas, manufactured gas, butane and compressed air.
WELDING TORCH W-46
Has long lever for closed hand or fingertip gas control, allows wider operating range. Weight, 14 ounces; length, 13 inches.
Meet all Underwriters Requirements
Weldimatics
... are daily cutting costs, reducing fire hazards in many of the world's largest industrial plants. Some distributor territory still available. Write today for descriptive bulletin.
996 OAKMAN BLVD.
Weldit
INC.
SINCE 1918
DETROIT 6, MICH.

CONSTRUCTION AND ENTERPRISE

ARIZONA

MORENCI, ARIZ.—Phelps-Dodge Corp., El Paso, Tex., plans to spend $250,000 remodeling its copper reduction plant.

ARKANSAS

EL DORADO, ARK.—Lion Oil Co. is contemplating building a $250,000 plant for the manufacture of protective coatings.

CALIFORNIA

ALBANY, CALIF.—Adhesive Products Inc., 430 Main St., San Francisco, has awarded a $250,000 contract to Wm. Horstmeyer Co., 23 Mars St., San Francisco, for construction of a factory.

BURBANK, CALIF.—Peerless Metals & Supply Co. is the firm name under which L. A. Standard Metals Inc., has published a certificate that it is conducting business at 3303 North San Fernando Blvd.

LOS ANGELES—Shore Metal Products Co. has been incorporated with a capital of $75,000 by Albert E. Marks, Agnes Aaberg, and Aaron Levinson, 715 Union Bank Bldg.

LOS ANGELES—Arcadia Metal Products Co. has been incorporated by Henry North Jr., Janith M. North, San Marino; and J. S. Johnson, Pasadena. It is represented by Hahn & Hahn, 808 Security Bldg., Pasadena.

LOS ANGELES—Southern California Gas Co., 810 South Flower St., has awarded a $1 million contract to Alex Robertson Co., 4015 West Jefferson Blck., Signal Pipe Line Construction Co., 2398 California Ave., Long Beach, and Utility Construction Co., 9830 Atlantic Blvd., South Gate, for construction of steel pipe lines from Shafer Summit to Imperial Valley.

VERNON, CALIF.—Special Tools & Machinery Co. is the firm name under which Freda Mary Vokal, Charles Davidson and Romeyn B. Sammons have published a certificate that they are conducting business at 4626 Pacific Blvd.

ILLINOIS

BELLWOOD, ILL.—Spraying System Co., 4021 Lake St., has awarded a $165,000 contract to the Cook Co., 228 North La Salle St., Chicago for a factory and office building; Olsen and Urbain, 5 South Wabash Ave., Chicago, architects.

BLOOMINGTON, ILL.—Ralston Purina Co., St. Louis, Mo., has awarded a contract to the Blaw-Knox Construction Co.'s Chemical Plant Division, 321 Pennsylvania Ave., Pittsburgh, for the designing and construction of a soy bean solvent extraction plant.

MOLINE, ILL.—Harrelson Motors has awarded contracts for a sales, service and garage building to cost $200,000. The general contract was awarded to George T. Hedberg & Son at $155,000; plumbing and heating to Lockhart Plumbing & Heating Co., $25,000; and electric work to Robbins Electric Co., $12,000. William F. Bernbrock, Architect and Associates, Fifth Avenue Bldg., prepared the plans.

INDIANA

ANDERSON, IND.—Anaconda Wire & Cable Co., Robert E. Wolford, manager, 31 and Nobel Sts., plans to build a $250,000 manufacturing plant.

INDIANAPOLIS — Glidden Co., 1160 West Eighteenth St., has awarded an $800,000 contract to Chris Jensen Co., 1385 Shelby Ave., St. Paul, for construction of a soya bean extraction manufacturing plant.

MICHIGAN

DETROIT—General Motors Corp., 2-153 General Motors Bldg. plans to spend over $1 million on a manufacturing and office building, receiving and shipping docks, overhead cranes, and additions to its Detroit Transmission Division; Argonaut Realty Division

SAVE TIME AND MONEY

with the CLECO HANDI-DRILL

The Self-Rotating Rock Drill

A Light Hand-Held Pneumatic Drill that Hits and Rotates for Faster Penetration

THE ROTATING-DRILLING ACTION ASSURES FASTER PENETRATION IN ALL TYPES OF MASONRY

AVAILABLE FOR IMMEDIATE DELIVERY

A Few of the Features

- ONE-HAND OPERATION
- LIGHT IN WEIGHT (9 LBS.)
- SIMPLE IN CONSTRUCTION
- PRACTICALLY NO RECOIL
- HITS AND ROTATES AT SAME TIME FOR FASTER PENETRATION
- CONVERTIBLE TO CHIPPING HAMMER BY REMOVAL OF ONLY ONE PART
- PATENTED SAFETY RETAINER PREVENTS ACCIDENTAL RELEASE OF TOOL FROM DRILL

CLECO AIR TOOLS — CLECO ACCESSORIES

CLECO DIVISION

of the REED ROLLER BIT COMPANY, P. O. Box 2119, Houston, Texas, U.S.A.

DIVISION OFFICES

MISSOURI	NEW JERSEY	RAILROAD DEPARTMENT	OHIO	PENNSYLVANIA
2322 Locust St. St. Louis	75 Lock St. Newark	50 Church Street New York 7, New York	431 Temple Bar Bldg. Cincinnati	Mascher at Lippincott St. Philadelphia, 33

IN CANADA: CLECO PNEUMATIC TOOL COMPANY of CANADA, LTD., 927 MILLWOOD ROAD, TORONTO (LEASIDE), ONTARIO

DISTRIBUTORS IN PRINCIPAL CITIES OF THE UNITED STATES AND THROUGHOUT THE WORLD

ERDLE PERFORATED SHEET METALS

ORNAMENTAL—INDUSTRIAL

For All Purposes
69 Years of Metal Perforating
Prompt Shipments

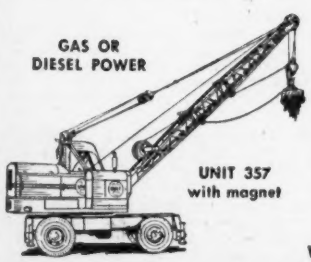
Send for Metal Sample Plates

THE ERDLE PERFORATING CO.
171 York Street — Rochester, N.Y.

UNIT 357 MOBILE CRANE

THE SCRAP YARD PORTABLE YARDMASTER

GAS OR DIESEL POWER



UNIT 357 with magnet

- It Rides on Rubber
- It's Self-Propelled
- It Has 1001 Uses!

Write for catalog showing UNIT'S many modern and exclusive features.

UNIT CRANE & SHOVEL CORP., Milwaukee 14, Wis., U.S.A.

Note to users of fine bearing metals:

the A.W. Cadman process, by ensuring perfect distribution of the hardening medium, greatly increases the life of the bearing, and removes the common cause of bearing trouble. For more information on bearing metals, consult with the Cadman people; we have been supplying bearing materials to industry since 1860, and we know most all the answers.

A.W. CADMAN MFG CO.
PITTSBURGH, PA.
ESTABLISHED 1860

A 5347-⅛

of General Motors Corp., General Motors Bldg., engineers.

MISSOURI

ST. LOUIS—Moloney Electric Co., 5390 Bircher Blvd., has awarded a $100,000 contract to Widmer Engineering Co., 918 Fullerton Bldg., for an electric transformer manufacturing plant addition.

NEW YORK

MASPETH, N. Y.—Welbilt Stove Co., 57-18 Flushing Ave., is planning to build a $250,000 factory and storage building at 59 Pl. and 60th Ave.; plans by Saul Goldsmith, 80 Livingston St., Brooklyn.

OHIO

CLEVELAND—Reliable Tool & Die Co., 1927 E. 55th St., plans to move to a building which it purchased at 2055 Hamilton Ave. from Grand River Vineyards Inc.

CLEVELAND—Hanna Coal & Ore Corp., together with Armco Steel Corp., Middletown, O., Inland Steel Co., Chicago, and Wheeling Steel Corp., Wheeling, W. Va., has purchased a substantial interest of around $12 million in Butler Brothers, iron ore operators in Minnesota, to insure a large continuing supply of raw materials for steelmaking.

CLEVELAND—Bettcher Aircraft Inc. has been incorporated through Louis A. Litzler, attorney, 709 Society for Savings Bldg., to design and manufacture airplane parts and accessories.

CLEVELAND—Pesco Products Co., R. J. Minshall, president, 11610 Euclid Ave., will build a boiler plant, factory and office on N. Miles Ave. costing $1,500,000; McGeorge & Hargett, 7016 Euclid Ave., engineers.

CLEVELAND—Eaton Mfg. Co., 4160 Mayfield Rd., has awarded a $75,000 contract to Dunbar Co., 8201 Cedar Ave., for alterations to its research laboratory.

CLEVELAND HEIGHTS, O.—Cleveland Electric Illuminating Co., 75 Public Square, Cleveland, has awarded a $100,000 contract to Bolton-Pratt Co., 1276 West Third St., Cleveland, for a substation at Cedar and Warrensville Center Rds.

RITTMAN, O.—Fayette Inc., Walter Fahey, vice president, has been established to produce truck bodies. The necessary machinery and equipment is being installed.

TOLEDO, O.—New York Central Railroad, E. A. Dougherty, chief engineer, La Salle St. Station, Chicago, has awarded a $175,000 contract to Duffy Construction Co., Terminal Tower, Cleveland, for a car maintenance building.

OKLAHOMA

PONCA CITY, OKLA.—Continental Oil Co. will expand and enlarge its refinery at a cost of $7,750,000.

PENNSYLVANIA

IVY ROCK, PA.—Alan Wood Steel Co., Conshohocken, will spend $9 million on roofing construction, sidings, an addition, and a steel mill; United Engineers & Constructors Inc., 1401 Arch St., Philadelphia, engineers.

TEXAS

THACKERVILLE, TEX.—Standard Oil Co. of Texas, City National Bank Bldg., Houston, will build a $125,000 compression type natural gasoline plant.

WASKOM, TEX.—La Gloria Corp., Driscoll Bldg., Corpus Christi, plans to build a $750,000 natural gasoline plant.

WASHINGTON

BELLINGHAM, WASH.—Puget Sound Pulp & Timber Co. is planning a $1 million program of renovating and improving pulp screening facilities. Its affiliate, Ketchikan Pulp & Paper Co., plans to begin construction next year of a pulp plant at Ward Cove, Alaska.

SPOKANE, WASH.—Production of alloys has begun at the plant leased by the Chromium Mining & Smelting Co. from the WAA. Ferro-chrome-silicon, being manufactured at the former Mead plant, will be used in the steel industry or shipped to the company's Riverdale, Ill., mixing plant.

TACOMA, WASH.—Rainier Steel Corp., Lincoln Ave. and Wapato Waterway, has awarded a $250,000 contract to C. F. Davidson, Provident Bldg., for construction of an ingot plant.

WEST VIRGINIA

EAST STEUBENVILLE, W. VA.—Wheeling Steel Corp. will construct a 10-inch pipe line in Jefferson county to carry gas from its coke plant here to the plant at Yorkville, O.

WISCONSIN

LUCK, WIS.—D. F. Duncan has awarded a $100,000 contract to F. Snyder for an assembly building, paint and tumbling building, dry kiln, and loading and shipping dock.

CANADA

SOREL, QUE., CAN.—Quebec Iron & Titanium Corp., c/o Ed Sinard, is planning to build a $14 million plant for refining titanium ore.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page* 161)

c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 10c per lb of briquet, c.l. packaged 10.8c, ton lot 11.6c, less ton 12.5c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 10c per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.75c per lb of briquet, c.l. packed 5.9c, ton lot 7.35c, less ton 8.25c. (**Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.9c c.l. packed 6.7c, ton lots 7.5c, less ton 8.4c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.75c, ton lot 21.55c, less ton 22.55c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va.; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more. 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.75 per lb of contained Cb, less ton $2.80; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.